

# The Iron Age

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Published every Thursday Morning by DAVID WILLIAMS, No. 83 Rensselaer Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XXXV: No. 13.

New York, Thursday, March 26, 1885

\$4.50 a Year, Including Postage.  
Single Copies, Ten Cents.

## The Occupations of Our People.

Gen. Francis A. Walker, Superintendent of the Census, has condensed in a series of lectures, which he delivered before the Lowell Institute, the leading facts developed by the census. Some of his figures on the occupations of our people are worthy of special attention, although they are now nearly five years old:

The census of 1880 gives the number of persons engaged in gainful occupations as 17,392,000, or 41.31 per cent. of total persons over 10 years old. These were engaged in the four chief lines of occupation as follows: Agriculture, 7,670,000; professional and personal services, 4,074,000; trade and transportation, 1,810,000; manufacturing, mechanical and mining industries, 3,837,000. In 1870 the number engaged in occupations was 12,505,000. Of those in 1880, 2,647,000 were women. The number of persons over 10 years of age is 36,761,000, leaving 19,369,000 unaccounted for. The latter number is about equal to the number attending school or physically incapable of labor. The census shows an increase over 1870 of about 30 per cent. in population, but an increase of 39 per cent. in the number engaged in occupations. This increase in number engaged in occupations over the gain in population is accounted for by the growth of the factory system. The lowest proportion of population engaged in occupation is in West Virginia and Utah, namely, 28 per cent., and the highest in Montana, 57 per cent. The great grain States keep down the proportion of bread-winners in their boundaries. The percentage in the cotton-growing States is higher, owing to the women and children going to the fields; in manufacturing States the percentage is higher still, owing to the employment of women and children in factories, while in the mining States it is highest of all. Agriculture remains the great occupation of the country, nearly one-half of all the laborers being engaged in that employment. The mining population has increased from 152,000 in 1870 to 234,600 in 1880. Of all in occupations, 23.4 per cent. are in professional and personal service, which includes from the lawyer and judge to the barber and common drudge. There are 1,889,000 under the head of common laborers. The number of clergymen in 1880 was 64,000, against 43,000 in 1870; the number of lawyers, 64,000 in 1880, 40,000 in 1870; the number of physicians increased during the decade from 62,000 to 86,000. In 1880 there were 4800 actors and 12,000 journalists in the country. The number of domestic servants is 1,076,000, an increase of only 10 per cent. in the decade, although the population gained 30 per cent. In 1870 there was one servant to every 7.76 families; in 1880 one servant to 9.24 families. The old region of household slaves abounds still with the largest proportion of servants, Virginia, Maryland and Delaware leading all the States. Next come the States north of them, although domestic service has decreased there since 1870. Comparing our indoor servants with England's, we find that 1,287,000 are the indoor servants there, exceeding the agriculturists by 50 per cent.—that is, one person in every 22 is an indoor servant there, while here the proportion is one in 47.

## The Smyth Process Again.

An old friend, whom we believed to have been demolished years ago by a report by Mr. G. W. Maynard, of this city, turns up again in England with that pertinacity which characterizes the "process crank." The London Iron Trade Exchange gives voice to the wonders of this "new" process as follows:

"We have received from Smyth's Caloric Association, 12, 13 and 14 Barbican, E. C., a pamphlet on 'Smyth's new system of caloric blast furnaces, and also for the production of wrought iron and steel direct from the blast furnace from any quality of ore or metal by atomized liquid compounds and a special apparatus, without fuel, puddling, heating, waste, fettling, shingling, cutting or piling.' This pamphlet is marked 'Confidential—for the Trade Only,' which, we presume, is not intended to prevent us giving our readers an epitome of its contents. Mr. Smyth's invention, as applied to blast furnaces, consists in 'the control and working of the furnace at the tuyeres.' The cost of the new tuyeres is estimated at £10 each, and they can be introduced with as much ease as an ordinary change of tuyeres is effected. Through these tuyeres 'cheap and inexhaustible compounds,' consisting of creosote, coal oil and sodium hydroxide, are passed into the furnace, and the result is such a decreased consumption of fuel that the cost of the pig iron is reduced 5/ per ton. Mr. Smyth's explanation of this is as follows: 'With the air blast we introduce water containing sodium hydroxide in solution as well as a liquid hydrocarbon, both the fluids being in an extremely minute state of division—that is to say, atomized by a special apparatus. The liquid hydrocarbon (creosote, petroleum or coal oil) immediately forms gas (C<sub>2</sub>H<sub>4</sub>), which, by its combustion, is of great use in producing a very high temperature. Sodium hydroxide yields the elements Na, O and H. Water is split up into its component hydrogen H<sub>2</sub> and oxygen (O). The incandescent carbon of the furnace is, as usual, oxidized to carbonic oxide CO, which, from the au-

perabundant supply of oxygen, soon forms CO<sub>2</sub>. This CO<sub>2</sub>, coming in contact with more incandescent carbon, again forms CO, and the process is maintained. The oxygen from the sodium hydroxide and water is available as well as that contained in the air blast. The large supply of free hydrogen from the C<sub>2</sub>H<sub>4</sub>, Na OH, H<sub>2</sub>O, in addition to its active influence, forms combinations with nitrogen of air blast (NH<sub>3</sub>) with

This result is caused by the very high temperatures produced with this process. It is impossible to state exactly what takes place in a furnace heated to about 2500° C., when these elements are injected, but their action is very potent and obvious; they effect the purposes they are intended to accomplish.' Mr. Smyth proposes to produce wrought iron direct from the blast furnace by drawing off the whole cast, or any part of it, into his

## The Colby Portable Boiler and Feed-Water Heater.

In our issue of March 5 we illustrated and described the Colby stationary boiler, built by the Colby Circulating Boiler Company, of Chicago, Ill., pointing out the several features of their system of circulation, combustion arrangements, &c. In connection with this the accompanying illustrations of

are furnished with the Colby vibrating-grate furnace, by which a constant and uniform supply of air is given for combustion. All the grate-bars are operated at once, at the will of the fireman, from the outside. The bars themselves, having a trough like top, hold ashes sufficient to act as a good non-conductor, thus preventing them from burning out or even springing.

All boilers and heaters made by this company are claimed to be of the best material, and as all parts are made with special machinery in duplicate, any piece may at any time be replaced on short notice.

## Is Water Gas Dangerous?

The contest between coal illuminating gas and water gas continues, the principal battlefield having been Massachusetts during the past year. In that State there is a law fixing the minimum quantity of carbonic oxide in illuminating gas, the limit being such that water gas is practically excluded. There was an elaborate hearing last summer, and, as usual, a sufficient number of experts and scientists could be found to supply both sides with the needed mass of contradictory evidence. The latest contribution to the subject is the following report by Profs. Wm. T. Sedgwick and Wm. Ripley Nichols:

"It is generally admitted that, while the other ingredients of illuminating gas are not without their physiological effects, when breathed with air, in a mixture in which they form a large proportion, nevertheless the only ingredient possessed of really toxic properties is carbonic oxide. Of this the intensely poisonous properties are well known, and they have been so long undisputed that they now belong to the common stock of science, and no longer require discussion. The effects upon animals confined in small space, of mixtures of this gas with air in known proportions, have also been sufficiently and carefully studied.

"It has seemed, therefore, to us, that the problems set before us would be solved best, especially from a practical point of view, not by further work in these well occupied fields, but by experiments conducted, as nearly as possible, under conditions likely to occur in the actual every-day use of illuminating gas.

"In making this preliminary report we shall give briefly the general results of our investigations, going into details only far enough to show the convincing character of the evidence upon which our conclusions are based. We have experimented with several of the higher animals—viz., dogs, cats, rabbits, guinea pigs and pigeons—and we have also, as will be mentioned further on, observed something of the direct effects of illuminating gas upon man himself. The experiments have been conducted at Newton, Mass.; Middletown, Conn., and Athol, Mass. In each case gas was taken directly from pipes of the local company, and our analyses have shown the coal gas distributed in Newton to contain about 7 per cent. of carbonic oxide, while the water gas supplied in Middletown and Athol contains about 30 per cent.

"The conclusions to which our experiments have led us are as follows:

"1. Water gas is decidedly more poisonous than coal gas.

"2. Our experiments confirm the work of others in proving that carbonic oxide is not a cumulative poison; that is to say, the breathing of certain small quantities for a long time is not equivalent in effect to the breathing of a large quantity for a short time, and this fact has much to do with the difference between the effects of the two gases, for an atmosphere containing a certain small percentage of coal gas may be breathed for many hours without serious effects, while an atmosphere containing the same amount of water gas will be injurious and even fatal.

"3. In order to produce distinctly poisonous effects by means of either coal gas or water gas it is necessary that the percentage of carbonic oxide in the mixture of gas and air shall reach a certain amount, and to accomplish this with coal gas in an ordinary room is a matter of some difficulty, as we have found, because the natural ventilation which is all the time going on through the walls, ceiling and floor, and through the cracks about the doors and windows, permits of so much diffusion that this, combined with the moderate amount of carbonic oxide present in the inflowing gas, does not allow the danger line to be easily reached. If it were not for this fact, accidents from the use of ordinary coal gas would be much more frequent than they actually are. With water gas, on the other hand, it is not at all difficult to reach the danger line—that is, to obtain, in an ordinary apartment, a dangerous percentage of carbonic oxide. This is not, as some suppose, on account of the somewhat higher specific gravity of the water gas as a whole, for this fact would influence but slightly the diffusion of the dangerous ingredient—carbonic oxide; but rather on account of the larger proportion of this poisonous ingredient which water gas contains.

"Water gas is therefore not only in itself more poisonous than coal gas, but is far more likely to produce injurious effects from similar accidental causes. It must not, however, be inferred that a gas containing twice as much carbonic oxide as another is neces-

(Continued on page 5.)

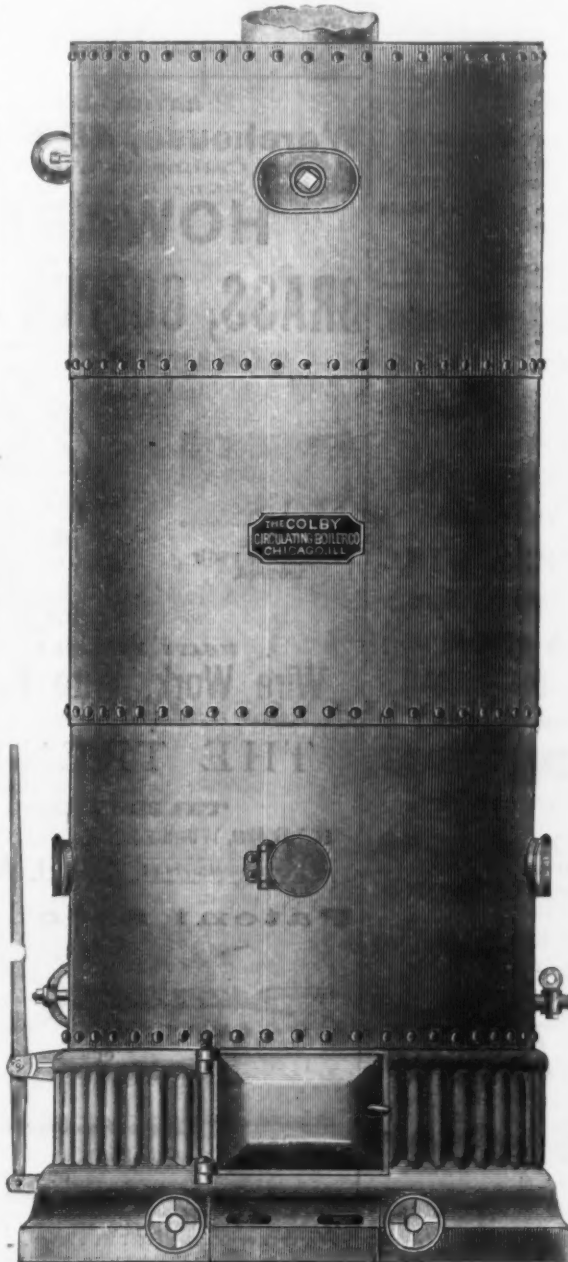


Fig. 1.—Elevation.

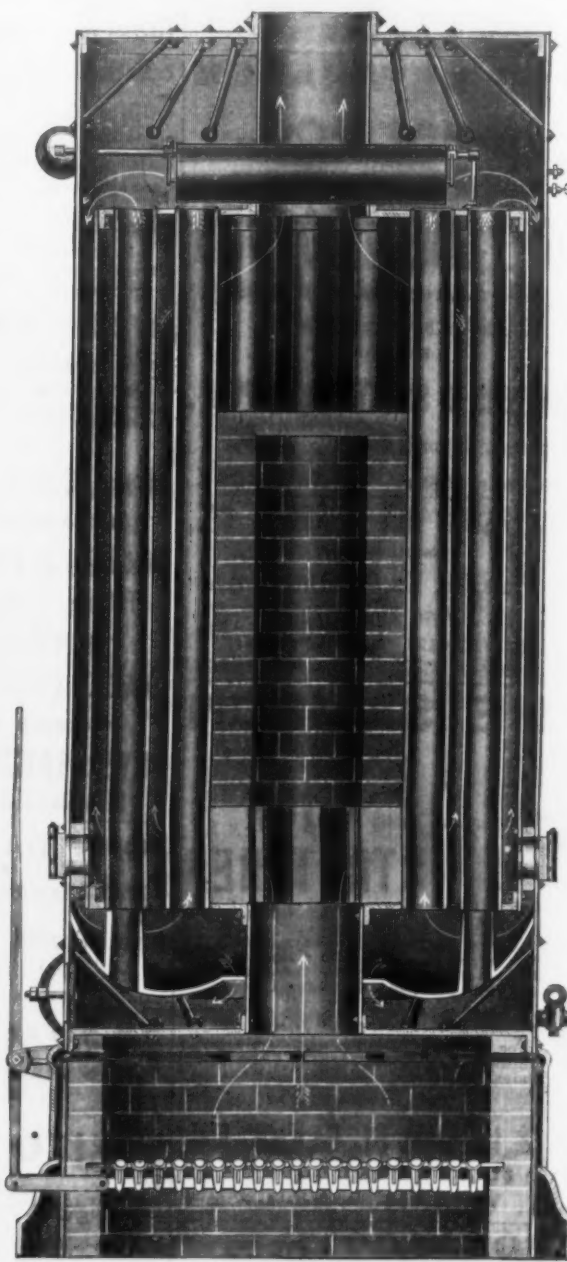


Fig. 2.—Longitudinal Section.

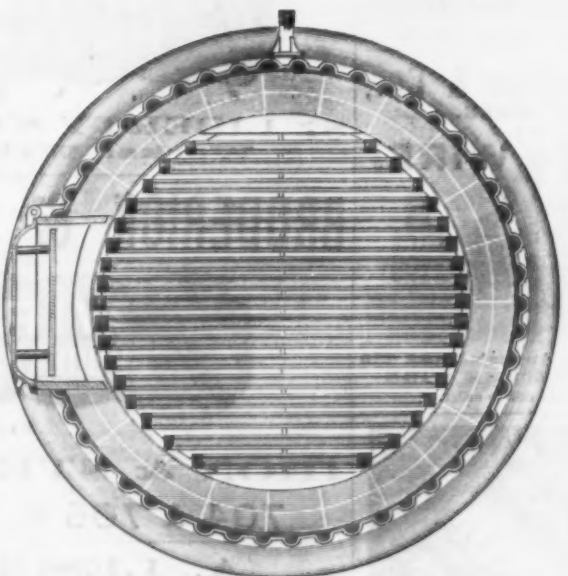


Fig. 3.—Cross-Section at Furnace.

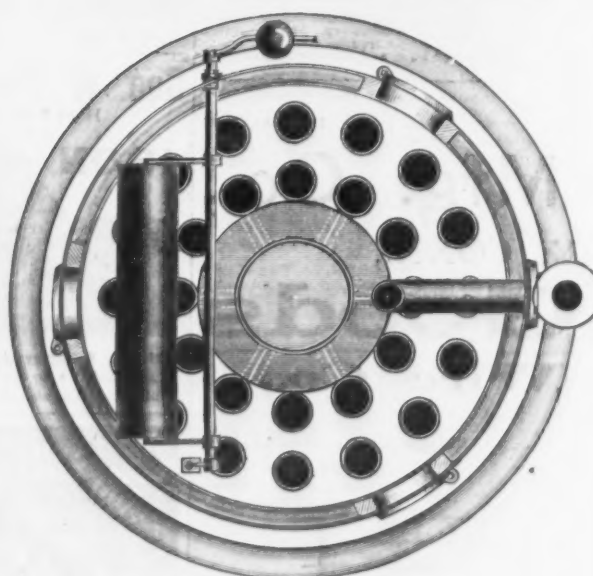


Fig. 4.—Cross-Section at Float Chamber.

THE COLBY PORTABLE BOILER, BUILT BY THE COLBY CIRCULATING BOILER CO., CHICAGO, ILL.

phosphorous (PH<sub>3</sub>), and with sulphur (H<sub>2</sub>S). The atmospheric nitrogen is in great part liberated from the furnace as such, but part is used to form ammonia and also cyanogen (CN) in small quantity. Probably vapor of sodium cyanide is a resulting product, the influence of cyanides of alkali-metals in carburization and reduction of iron has been long considered important. It seems at the hottest part of the furnace, and at the point where combustion is most perfect, that carbon exists in the solid state from the dissociation of carbon monoxide (CO) into carbon dioxide (CO<sub>2</sub>) and carbon.

patent refining manipulator, which he says will do away with 'the greatest trouble in the wrought-iron trade—the puddlers'—while the use of this 'manipulator' will enable producers of wrought iron to compete successfully with soft steel of uncertain carbon, and restore to wrought iron its old position."

If our memory is not at fault, Mr. Smyth has said very much the same thing before. He stated that this process would eliminate phosphorus. Mr. Maynard reported that it would not, and that settled it for the time being.

their portable boiler, showing longitudinal and cross sections, will be of some interest. The boiler embodies all the essential features of that already described, and being complete in itself requires no mason work, except in the foundation. In view of the character of the engravings, which show all that should be known to fully understand the arrangement of the boiler, further description is unnecessary. It is built in sizes ranging from 5 to 30 horse-power, and is adapted to printing-houses, elevators and small manufactories of all descriptions. Both the portable and the stationary boilers



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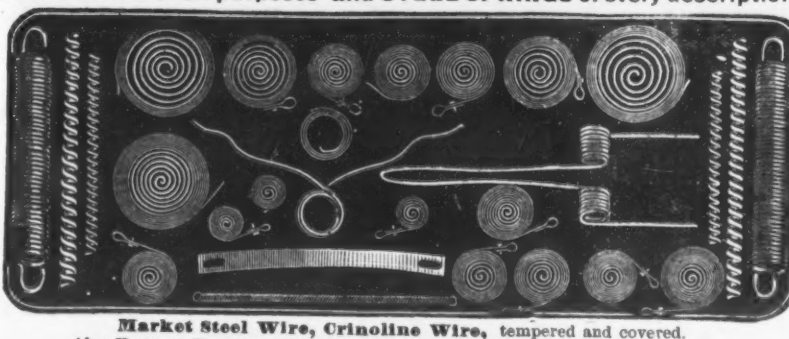
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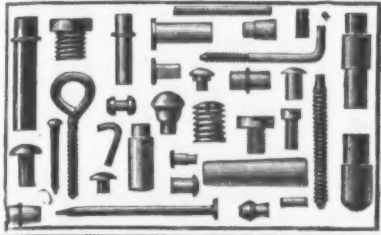


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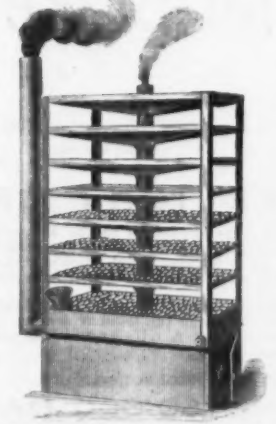
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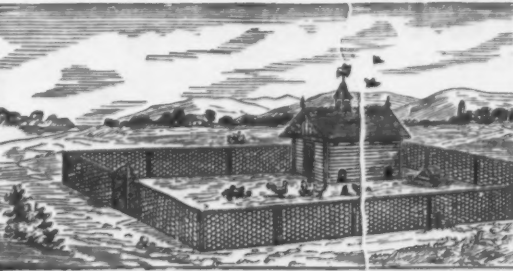
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(Concluded from page 1.)  
sarily only twice as dangerous. On the con-  
trary, the danger increases, particularly with  
certain percentages, very much more rap-  
idly than this.  
In conclusion, we may say that our  
opinion, based upon experiments, is decid-  
edly averse to the general distribution of the  
so-called water gas, containing, as it does, a  
large proportion of carbonic oxide. This  
opinion has been strengthened by our visits  
to Middletown, where that gas has been for  
some time in use. But as the health officer  
of your board has himself visited that city,  
we do not feel it necessary to rehearse the  
facts there ascertained.  
This report is certainly strong enough to  
startle the community, but, in view of the  
fact that a very large proportion of the gas  
used in New York is water gas, it is difficult  
to quite agree with the learned gentlemen as  
to its dangers.

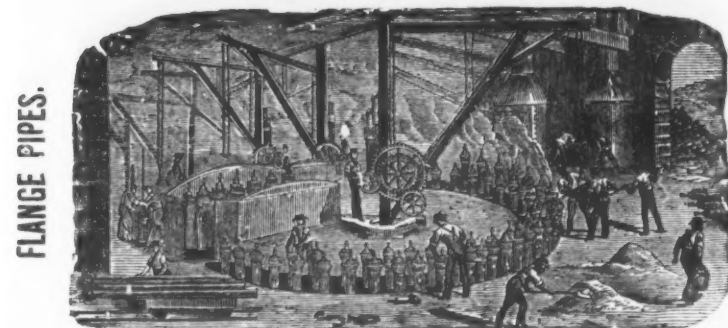
**The Salisbury Iron Region.\***  
**The Blast Furnaces.**—The two nearly  
parallel railroads, viz., the Housatonic, in  
Connecticut and Massachusetts, and the Har-  
lem Railroad, in New York, furnish the  
bases for dividing the blast furnaces con-  
veniently. All of the furnaces are not on  
railroads, nor do they all use the above  
roads for carrying stock; but for the pres-  
ent purpose we may describe the district as  
commencing on the Housatonic Railroad at  
Kent Furnace, in Connecticut. This furnace  
is on the Housatonic Railroad and consists of  
a stone stack, 9 feet in diameter at bosh and  
32 feet high, with water-power blowing ap-  
paratus. In addition to a local ore supply,  
this furnace draws part of its stock from the  
Salisbury ores. Following northward 8  
miles along the railroad, the next furnace is  
that of the Cornwall Bridge Iron Works, a  
stone stack (diameter of bosh 9 feet, height  
32 feet), with water-power driving the blast  
machinery. The ore supply for this furnace  
comes from the Salisbury mines. The next  
works in a northerly direction is the furnace of  
the Hunts-Lyman Iron Company, located at  
Huntsville, 4 miles east of the railroad. This  
is a stone stack, 32 feet in height and 9 feet  
diameter at bosh, equipped with steam and  
water power for producing blast. The ore  
supply is hauled from the Salisbury mines.  
Between the Housatonic and Harlem Rail-  
roads the Sharon Valley Furnace is located.  
This is a stone stack, 31 feet high, lined to a  
bosh diameter of 9 feet 6 inches, and oper-  
ated by blowing machinery driven by water-  
power. The ore supply comes from the  
Salisbury and American mines. The Lime  
Rock Furnace is the next in order going  
north, but, like the two just named, is not  
located on the railroad. This furnace has a  
most picturesque location in the gorge made  
by the stream which supplies power for the  
blowing apparatus; the stack is of stone,  
9 feet diameter at bosh, and 32 feet in height.  
Following still further northward are the  
three Canaan Furnaces, on the Connecticut  
Western Railroad. These three stacks are  
close together and are generally considered  
as one plant; they are each stone stacks  
and have all of them a bosh diameter of  
9 feet, and are 32, 36 and 40 feet high,  
respectively. The blast is supplied by steam  
and water power combined, and the ores are  
obtained from the Salisbury mines. The  
Chapinville Furnace, on the Housatonic Rail-  
road, is a new stone stack, which was built  
to replace one destroyed several years ago.  
Its dimensions are: Diameter of bosh, 9 feet;  
height, 40 feet.  
The nine charcoal blast furnaces above  
described are all located in Litchfield County,  
Conn., but passing northward into the ad-  
joining county, viz., Berkshire County,  
Mass., there are five more blast furnaces;  
one of these is the Pomeroy Iron Works, at  
West Stockbridge, which formerly used an-  
thracite as fuel. The others are charcoal  
furnaces, and three of them are combined  
under one management as the Richmond  
Iron Works. These furnaces, stone stacks,  
all of them, are the Vandusenville, Richmond  
and Cheshire. The ores used are from local  
deposits, supplemented by the Salisbury  
ores.  
The Vandusenville Furnace is on the  
Housatonic Railroad. It has a bosh diameter  
of 9 feet and a height of 32 feet. It is op-  
erated by combined steam and water power.  
The Richmond and Cheshire Furnaces are  
located on the Boston and Albany Railroad,  
and are each 32 feet in height, with diam-  
eters at bosh of 9 feet, and are equipped with  
steam-power for operating the blast machin-  
ery. The Lanesborough Furnace completes  
the list of charcoal blast furnaces approxi-  
mately on the line of the Housatonic Rail-  
road. This is a new stone stack, built to  
replace one destroyed. It is lined to a bosh  
diameter of 9 feet 6 inches, and has a height  
of 33 feet. The ores used are from local  
beds. It is operated by steam-power, and  
is the only furnace in the region under con-  
sideration operating with a closed top.  
Returning south, we find that there are six  
charcoal furnaces practically on the Harlem  
Railroad. The most southern of these is the  
Shaparon Furnace, near Dover. This is a  
stone stack, located off from the railroad,  
but the plant was practically destroyed by  
fire, and has not been rebuilt. Its dimen-  
sions were 9 feet 6 inches by 40 feet, and it  
was blown by water power machinery and  
depended upon local ores. The next fur-  
nace north on the Harlem Railroad was Was-  
satic, a stone stack 9 feet 2 inches diameter  
at bosh, and 32 feet high, using America  
hematite and local carbonate ores. The  
blast is developed by water-power. Con-  
nected with this furnace are conical stone  
kilns for producing charcoal, and cylindrical  
kilns for roasting carbonate ores. Continu-  
ing up the railroad, Irondale Furnace, of the  
Millerton Iron Company, is reached, a stone  
stack lined to a bosh diameter of 9 feet,  
and 32 feet in height, equipped with steam  
blowing machinery. The ores used are  
Salisbury and Pawling. This furnace will  
probably be thoroughly remodeled and mod-  
ernized in the spring. One mile from Iron-  
dale is the Phoenix Furnace, a stone stack  
equipped with steam-power blowing ap-  
paratus. Its dimensions are: Bosh diameter,  
9 feet; height, 33 feet. This is the nearest

\*From the February number of the Journal of  
the United States Association of Charcoal Iron  
Workers.



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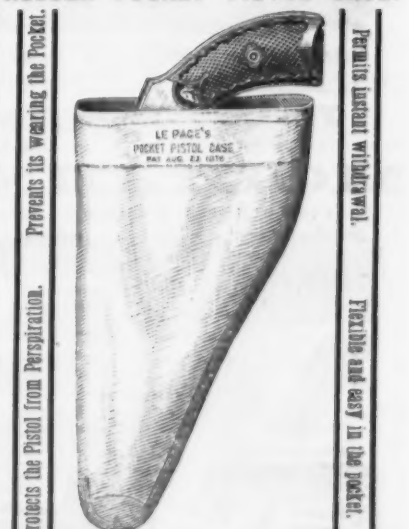
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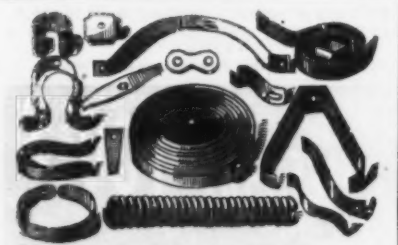
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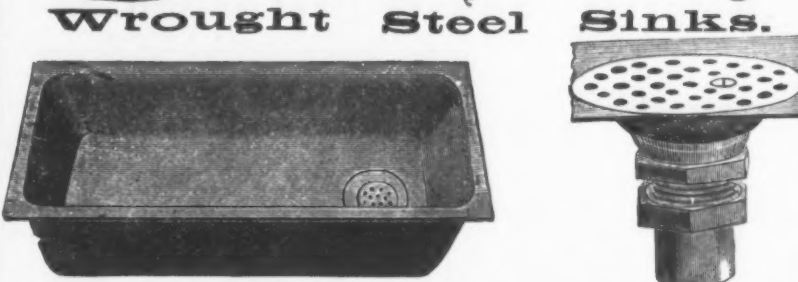
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and wrought-iron pipe; is a neat, reliable coupling, and is easily detached for the purpose of pumping  
out the pipe. The strainer and all parts of the coupling are tinned, and are furnished with all sinks  
without extra charge.  
The fact of the great strength and durability of this sink, as it is practically free from danger of  
breakage in transportation, handling or use, is a strong point in its favor, and that its merits are  
recognized by most competent judges is evident from the fact that leading houses which have been  
interested in the common article have taken up the Wrought Steel Sink. Twenty-five per cent. is  
saved in freight by purchasing Steel Sinks. Orders come from all parts of the United States, Canada,  
Europe and Australia.

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Single and Double Acting Spring Hinges,  
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Patent Rubber Buckets,  
Wooden Well Curbs, Wood Tubing,  
Iron and Brass Pumps,  
Patent Copper Pumps,  
Hydraulic Rams, Power Pumps,  
&c., &c., &c.

**FIG. 114 REPRESENTS OUR  
Hand Force Pump.**  
It is made of brass, is strong and light, and is the best pump of its kind in the  
market. Write for prices.

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GEORGE BROOKE, President. GEO. W. HARRISON, Treasurer

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MANUFACTURERS OF

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Small T Rails, Flat Rails of Iron or Steel, Fish Bars of Iron or Steel,  
WHEELING, W. VA.

furnace to the Salisbury mines, from which  
it obtains a portion of its supply, the balance  
being obtained close to the furnace. The  
four furnaces just described are all in  
Dutchess County, N. Y.

Further up the Harlem Railroad are the  
Copake and Chatham furnaces, in Columbia  
County. The Copake Iron Works depends  
upon a large ore bank at the furnace and  
others a few miles south. It has a most  
picturesque location at the mouth of a gorge  
celebrated for the Bash Bish Falls, about 1  
mile distant. The furnace is of stone, 9 feet  
diameter at bosh and 32 feet in height. It is  
equipped with duplicate blowing machinery,  
driven by water-power, and is managed by  
Mr. William A. Miles, president of the United  
States Association of Charcoal Iron Work-  
ers. The Chatham Furnace is the furthest  
north of this group of furnaces, and is a  
stone stack 9 feet diameter at bosh and 32  
feet in height, operated by steam-power.  
The ores are obtained from various points  
along the Harlem Railroad. The furnaces  
practically operated by the Barnum-Richard-  
son Company include the Cornwall Bridge,  
Sharon Valley, Hunts-Lyman, Lime Rock,  
Ironton Furnaces and Richmond Iron  
Works, 11 in all.

The similarity in construction is quite  
marked throughout the region, and the gen-  
eral arrangement of a blast  
furnace is shown by Fig.  
1, a vertical section. All  
of the furnaces have open  
tops, but the arch F of the  
combustion chamber of the  
hot-blast stove O extends  
partly over the throat of  
the furnace, leaving, how-  
ever, room for charging  
the stock through a large  
opening in the draft-stack.  
The hot-blast stoves are of  
standing U-pipe, generally  
28 in a stove; by means of  
dampers the gases pass into  
the combustion chamber,  
then into the pipe chamber,  
from which they enter the  
draft-stack. At Copake  
Iron Works the hot-blast  
stove is composed of 40  
suspended U-pipes. The  
hearth of the Phoenix, Co-  
pake and Chatham furnaces  
are protected by water cast-  
iron jackets. None of the  
other plants are similarly  
equipped. While Fig. 1  
represents the general shape  
of the blast furnaces of the  
region, lately sleeper boshes  
have been adopted at sev-  
eral plants. The blast is  
conducted from the blow-  
ing machinery to the hot-blast oven placed at  
the throat of the furnace. It first enters the  
bed-pipe A, which is connected by a series  
of T-shaped cast-iron pipes or syphons (the

Fig. 2 represents the form of blowing ap-  
paratus generally used at the furnaces of  
the Salisbury region. A and B are the  
blowing cylinders, which are operated by an

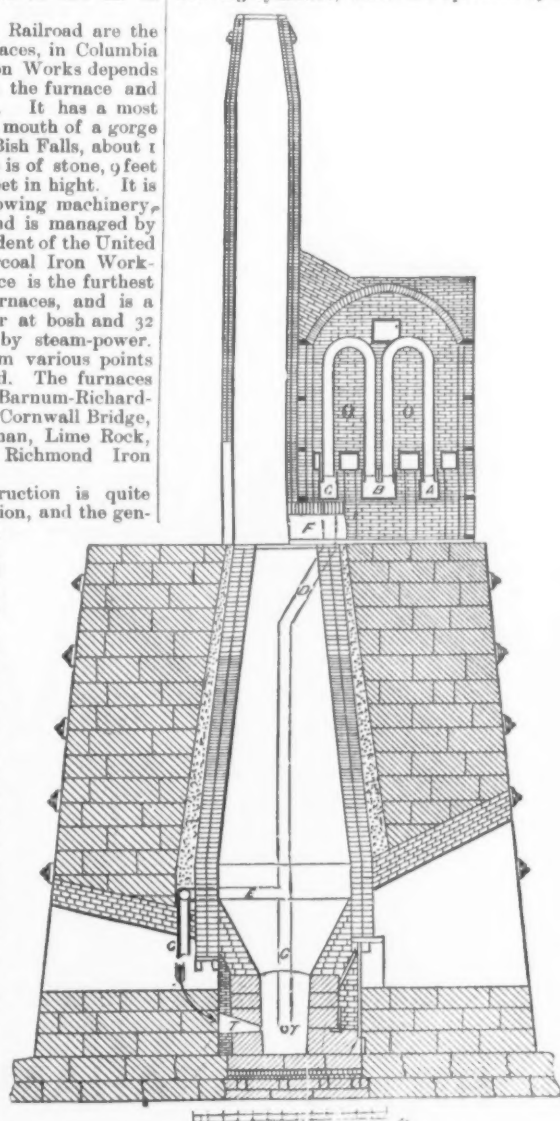


Fig. 1.—Section of a Stone Stack.

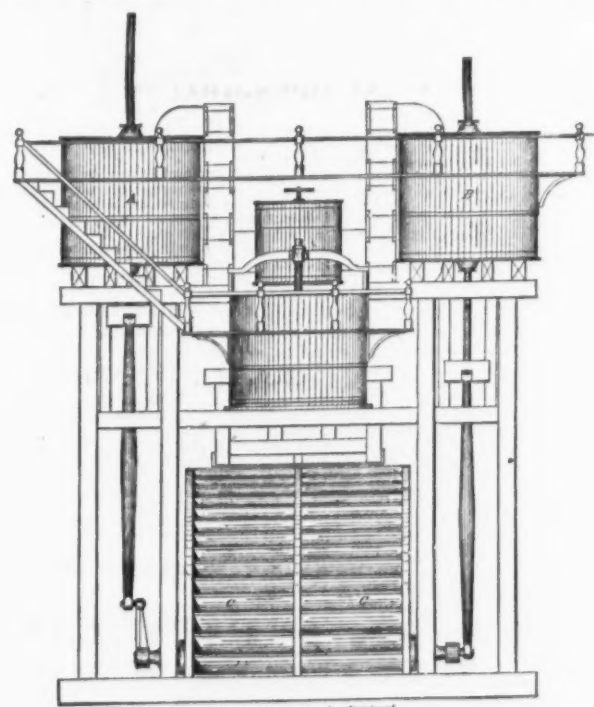


Fig. 2.—Blowing Engine Driven by a Water-Wheel.

form of the section of which is that of a con-  
densed letter O) with the bed-pipe B, which  
in turn is connected in a similar way with  
C. The air, after being warmed, is carried  
down alongside the furnace in-wall, and be-

which are fastened together with long iron  
bolts or rods extending from one head to  
the other. This form of engine is cheap,  
and, for the low pressures employed, works  
satisfactorily. They are, however, not

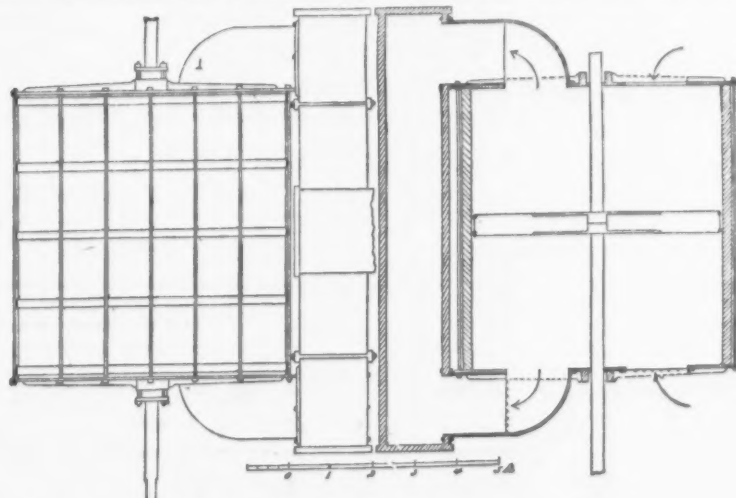


Fig. 3.—Blowing Cylinder.

tween it and the stone masonry of the stack  
by two pipes, one of which, D D, is shown in  
dotted lines. These pipes are connected at  
the lower ends with a horizontal bustle-pipe  
(F) encircling one side of the furnace, and  
from which the air is carried down to the  
tuyeres T T by branch pipes G G.

economical in the power applied. Some of  
the furnaces have vertical engines, as  
shown, and others have the cylinders placed  
horizontally. Air receivers are not used,  
but the blast pressure is ordinarily regulated  
by a floating piston, properly weighted, and  
moving in a third wooden cylinder. Some



Paris, 1878.

**McCAFFREY & BRO.,**

PENNSYLVANIA FILE WORKS

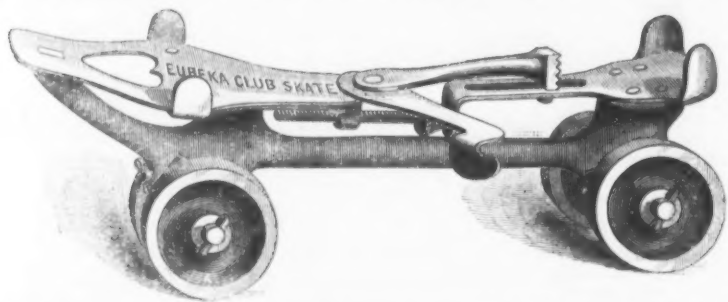
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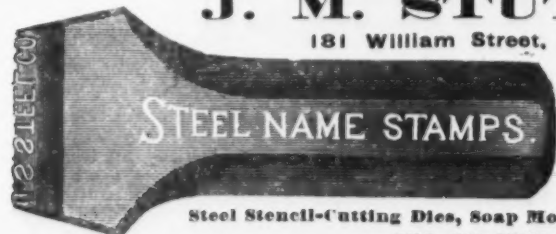
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Feather Edge,  
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Flat,  
Flat Equaling,  
Flat Wood,  
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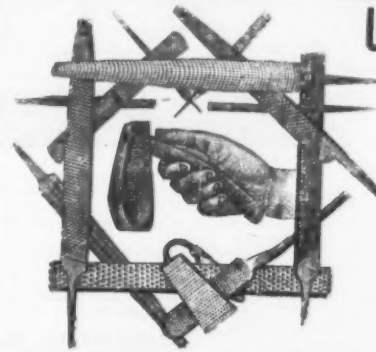
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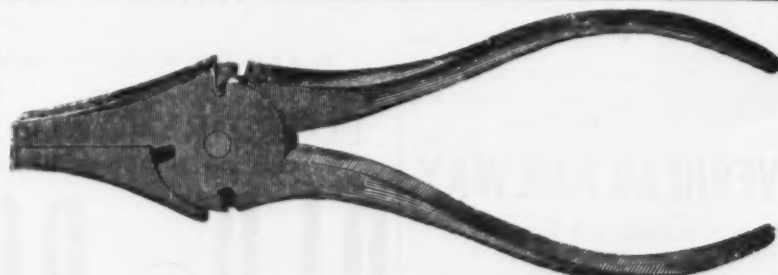
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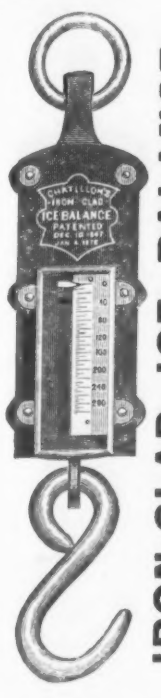
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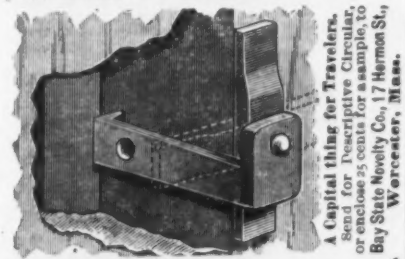
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 Simple, Inexpensive, Accurate.



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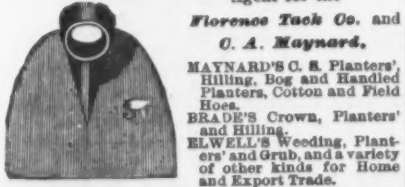
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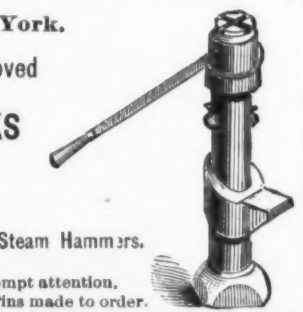


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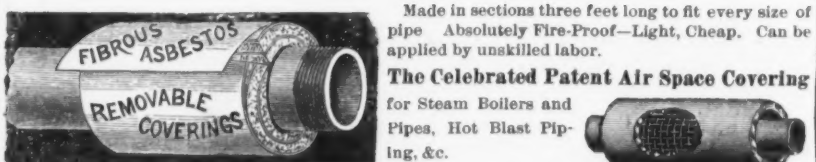
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**Pound, Half Pound and**  
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 Our spooled **Hair Wire** is  
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 Eastern Agents.

Manufacturers and the Trade are warned not to infringe on our patent, No. 294,740, either by manufacturing  
 or selling.

of the blowing cylinders are connected to turbine-wheels, but the necessity of inter-  
 vening gearing to secure the necessary slow  
 motion makes these less efficient than others  
 operated direct from wheels which give a  
 lower coefficient than turbines.

Fig. 3 shows one blast cylinder in eleva-  
 tion and one in section; the elevation ex-  
 hibits the arrangement of bands and bolts;  
 the section illustrates the inlet and outlet of  
 air by arrows and the piston-rod. As the  
 pistons are packed with leather, they pro-  
 duce the peculiar sounds of "a blast furnace  
 in labor," as they slowly move through their  
 stroke.

There are now in the region eight furnaces  
 active and 11 practically ready for blast.  
 The abandoned stacks are, in the Harlem  
 Valley, New York: The old Dover Furnace,  
 part of which still remains; the Weed  
 Furnace, at Sharon Station, and one at  
 Sharon, Conn. In the Housatonic Valley:  
 The Bull's Bridge Furnace, the Macedonia  
 Furnace, one at West Cornwall, one at Falls  
 Village, one at Dogtown, and one at Lake-  
 ville. These, with the Mount Riga Furnace  
 and Joyce Furnace, all were active plants in  
 Litchfield County, Conn. Mr. H. P. Harris,  
 to whom we are indebted for the above data,  
 names 16 abandoned furnaces in the region,  
 including three in Berkshire County, Mass.,  
 viz.: One at Housatonic, one at Lenox and  
 one at North Adams.

**The Columbia Two-Track Tricycle.**

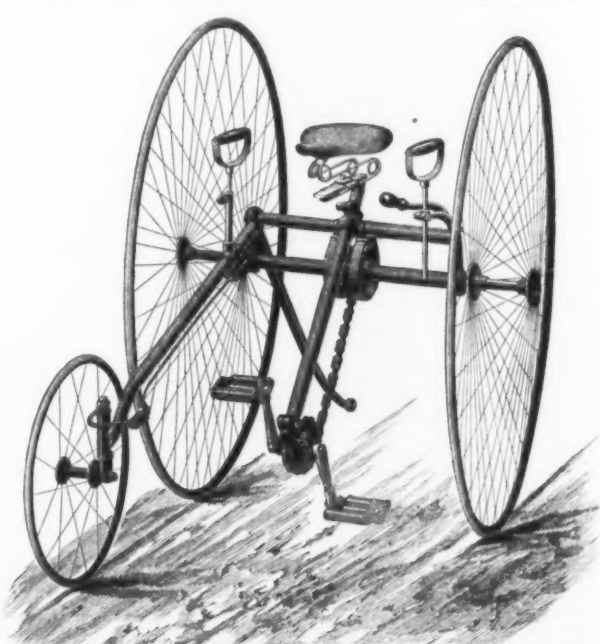
Among the new machines that are to ap-  
 pear this season is the "Columbia" two-  
 track tricycle, made by the Pope Mfg. Co.,  
 of Boston, which will be put on the market

also call attention to the inclined seat-rod,  
 Fig. 4, which operates to move the saddle  
 backward, also when it is raised to preserve  
 the relative positions of seat and pedal, and  
 by an ingenious attachment of the crank  
 supporting tube tangent to the horizontal  
 one, instead of flush with it, the seat-rod is  
 made to move in and out free of everything.  
 Another new feature in this tricycle is the



Fig. 4.—Cradle Spring and Seat-Head.

building of the wheels directly upon the tub-  
 ular half-axes, as is shown in the sectional  
 view. By the substitution of hollow parts  
 and other changes the weight of the machine  
 has been reduced over 20 pounds without  
 weakening it in any degree. The middle  
 driving or short crank-shaft feature is a re-  
 turn to an old principle of tricycle construc-  
 tion, which has been displaced at times for  
 necessities of other parts or fashions in  
 structure, but which, for steady effective-  
 ness and lightness in this machine, the mak-  
 ers believe to be the best, and the two-track  
 feature, though not broadly new, has been  
 embodied with improvements in this ma-



Columbia Two-Track Tricycle.—Fig. 1.—Perspective View.

about April 1. Fig. 1 presents a perspective  
 view of the machine, showing its general  
 construction and arrangement. Among the  
 new features introduced in it is the Wallace  
 dwarf steering-head, shown in Fig. 2, which,

chines, so as to give equal steadiness of run-  
 ning and the stability of front steering, with  
 the two added advantages of an open front  
 for convenience and but two lines of resist-  
 ance to the wheels.

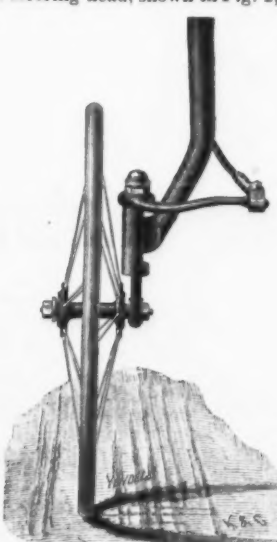
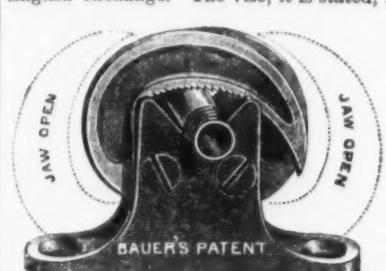


Fig. 2.—Wallace Dwarf Steering-Head.

besides its neat appearance and lightness,  
 conducts the strain more directly from the  
 steering-wheel to the driving gear, and in-  
 sures greater steadiness of motion. The  
 spiral rack and its connections, by which  
 the steering apparatus is made more simple  
 and effective, the three-part frame jointed

**A Novel Tube Vise.**

The accompanying cut, which illustrates  
 Bauer's patent tube vise, is taken from an  
 English exchange. The vise, it is stated, is



A Novel Tube Vise.

is of an entirely new construction, and is  
 said to possess many advantages over the  
 ordinary form of tube vises. It will be  
 noticed from the illustration that the two  
 arms are similar in appearance and action  
 to the claws of a crab. When a tube or bolt  
 is placed in the angular seating, as shown,  
 and the arms or jaws shut, an instantaneous  
 grip is secured, which becomes firmer as  
 greater exertion is brought to bear on the  
 tube. Thus the article is essentially self-  
 gripping and self-acting, although the jaws  
 and frame together weigh only 3 pounds,

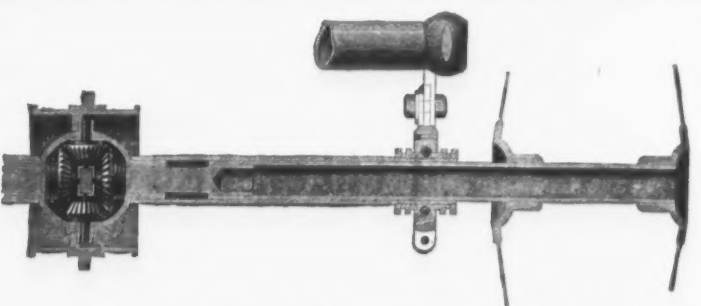


Fig. 3.—Sectional View of Axle with Differential Gearing.

in a peculiar way, the double-band brake,  
 securing greater effectiveness, and the com-  
 bination of brake-drums, sprocket and bal-  
 ance gear together and in the middle under  
 the seat, are claimed to be particular points  
 of excellence in the new machine. Fig. 3  
 shows a sectional view of the large, welded-  
 steel tubular axles, together with the differ-  
 ential gearing. The substitution of this form  
 in place of the solid shafts previously used  
 secures greater strength, together with an  
 economy of weight. The manufacturers

against 15 pounds for the ordinary appliance.  
 The smallest size is capable of holding from  
 1/4-inch to 1 1/4-inch tubes, and the second  
 size from 1/4 inch to 2 1/2 inches. It is es-  
 pecially adapted for plumbers' or gas fitters'  
 use. It is very simple in construction and  
 has no screw to get out of order, so there is  
 no stripping of the thread; it will work in  
 any position, is instantaneous in its action,  
 is easily fixed, and, being made entirely of  
 steel and wrought iron, it possesses great  
 durability.



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NOW, This, is to Witness, that, in consideration of the forbearance of the Representatives of the said John Wilson to sue me for damages for the wrong aforesaid, I do hereby undertake and agree,

FIRST, to surrender and deliver to the Attorneys for the said John Wilson all knives now on hand, and in my possession, or under my control, bearing the said imitation trade-mark, and

SECOND, I further undertake and agree to and with the said John Wilson and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid, or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereunto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1885.

WITNESSES:  
E. M. REED,  
(Attorney for Defendant.)

G. A. ROBINSON. L.S.

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Mark.

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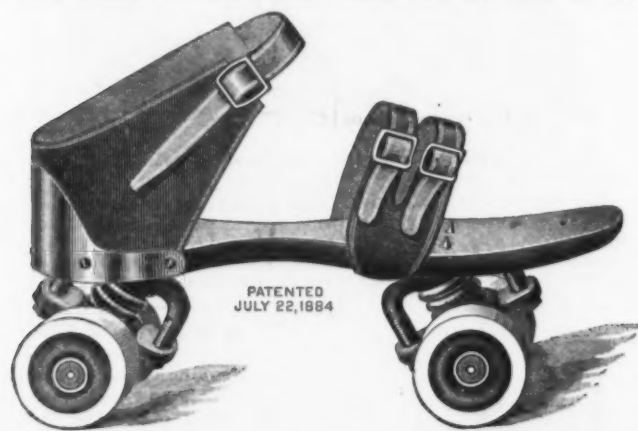
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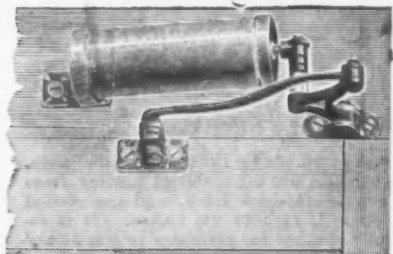
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MAR. 4<sup>TH</sup> 1884

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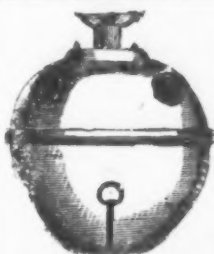
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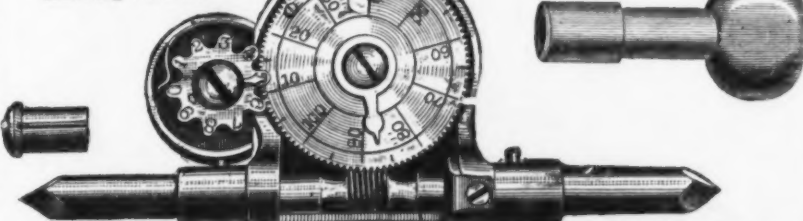
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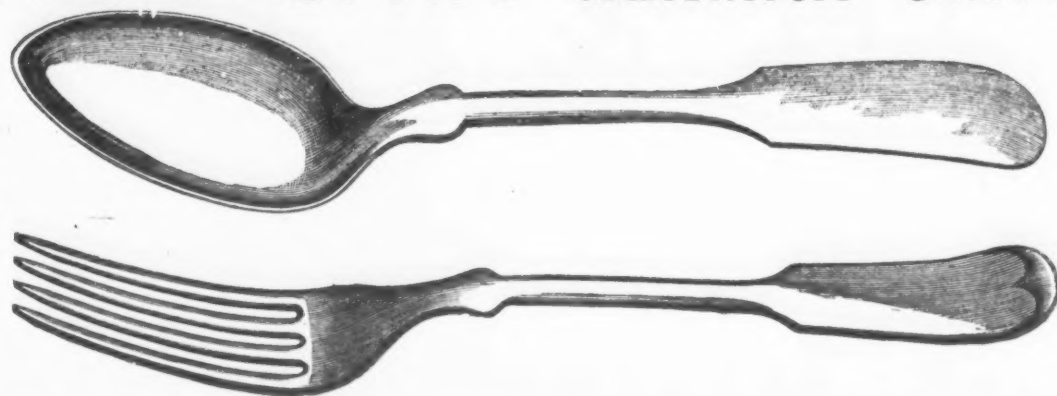
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The Mouse goes in to get the bait And shuts the door by his own weight. And then he jumps right through a hole And thinks he's out; but, bless his soul He's in a cage, somehow or other, And sets the trap to catch another.

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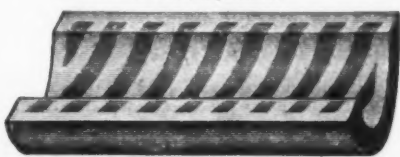
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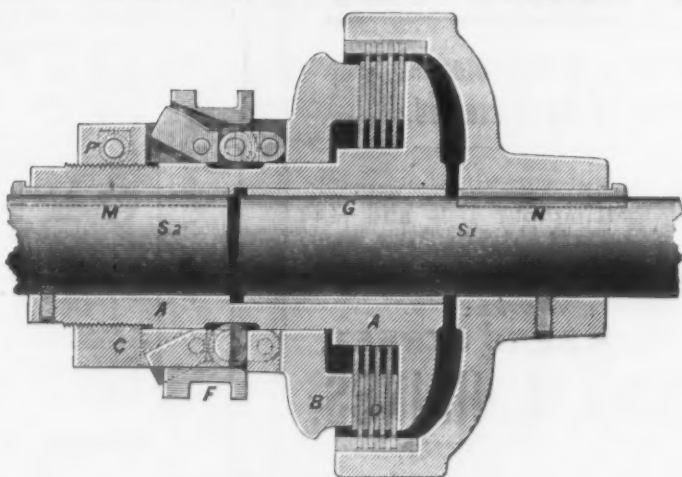


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Made wholly of metal. No wood or leather surfaces. Entirely free from collar friction or end thrust. Runs without noise and without loss of power in driving. Friction surfaces are of flat sheet metal; easily renewed. Adjustments are simple, easily made and positive. Easily applied; the working parts all attached to a central sleeve.

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## Mutual Fire Insurance.\*

It happened to fall to me to become an underwriter in the year 1878, having previously been a director for many years in several factory mutual companies. I took the charge of a company and became connected with a system which had outgrown its original methods, and for about two years the principal part of the work consisted in bringing all the data and the experience of all the companies into a connected form. The executive officers of my own and of other companies were able men, and by them and by my predecessors the foundations had been laid in a most solid manner. My own function has only been to continue and to aid in improving it. But even the mills and work of the members had in many cases outgrown the system itself, and the line of insurance needed by them could not all be carried on the mutual principle. We therefore began to study the ways in which the increasing value in mill yards could be more fully protected; we called for more water, better and more numerous pumps; invented or caused to be invented safer lanterns; we drove unsafe oil out of the mills and compelled all the manufacturers of oil to change their method and to offer only safe oil to our members; we made a scientific study of spontaneous combustion at the Institute of Technology, and we investigated all the causes of fire, including electricity. Without covering any wider range in the classes of risks or occupations insured, we yet made it cheaper for good risks of such kinds to come in rather than to stay out, not by bidding low rates of premium, but by increasing our average dividend, so that the seven years' profits, had they been accumulated at 5 per cent. and were now invested at 5 per cent., would yield an income sufficient for the perpetual insurance of every mill or works insured at its average cost. We have doubled our business while thus reducing the losses, the expenses and the cost of insurance.

But there has been one drawback to the satisfaction which one might take in directing this work. Our very members, who would have turned us out of office had we insured mills and works built like their own city warehouses, would yet persist in constructing and occupying city warehouses which were then, and are now, costly examples of combustible architecture of the most pernicious kind. In our report for January, 1880, we laid down a plan of operations for the insurance and protection of city risks, which is almost identical with the one on which you are now moving. But no one gave it any attention; it seemed to be cheaper to pay an insufficient premium to a weak insurance company, whose managers were ready to bet that bad risks would not burn with the odds against them, than to take the necessary steps to remedy the wrong.

There was but one end, easily foreseen, and that end has come in a fire tax for loss by fire, cost of sustaining insurance companies and cost of fire departments of about \$160,000,000 per year, or not less than \$1.25—probably a greater percentage—out of each \$100 produced in the whole country.

What are you going to do about it? You cannot remedy many of the existing faults of construction, therefore you must be prepared to flood every building in the first five minutes. This you can do by means of standpipes and hydrants upon the roofs. You can place automatic sprinklers in most or in many places. Yet you must be insured by insurance contracts in order to protect your credit, and the purpose of this meeting is to consider that question. Old methods of reckless insurance are going out, weak insurance companies have become bankrupt or have withdrawn from business, strong companies are charging higher and higher rates and must keep on. You cannot lower the rate until you reduce the loss. The gain, if I may be a little sarcastic, is the other way. When I first began to tabulate we only burned one hotel a day; now it is one and one-half. Then we only burned one church a week; now we burn two. Then only one hospital, asylum or almshouse per month, with occasional loss of life; now we burn two per month and sacrifice many lives almost every time. On commercial risks the losses mount higher and higher, and a national commercial panic is at the mercy of an insufficient supply of water in more than one of our great cities. You cannot meet this emergency by a mutual agreement to grant indemnity for losses; you can only meet it by a mutual agreement to prevent losses. All I can do for you is to show you what it costs and what it profits to do this. In 1884 all the insurance companies reporting to the insurance commissioner of New York received fire premiums in round figures, \$78,000,000. The rate in 1883 was a little less than 1 per cent., but on the advanced rates of 1884

The premium was probably paid on—\$7,800,000,000  
Their losses in round figures were 94 per cent. 50,000,000  
Expenses, taxes, &c., 37 per cent. 28,500,000  
All the factory mutuels have insured during their existence about half as much.

In round figures—\$3,850,000,000  
Premiums received. 33,923,855  
Cost of insurance—i. e., losses and expenses. 12,216,109  
or 43 per cent. of the expense only of the other method.

Dividends and value of assets. \$21,707,195  
If the mutuels had covered the same amount as the stock companies above named—i. e., \$7,800,000,000—at 1 per cent., their actual rate being less, but the inherent risk of the property insured greater except for the safeguards adopted, then their losses and expenses would have been \$25,000,000, and their dividends or assets representing profits would have been \$53,000,000.

Now, the simple question presented to you is this: To what extent can the mode of construction and the safeguards against loss by fire, which constitute the open secret of the success of the factory mutual system, be imported into the general risks, with the object of saving each year to the assured \$3,000,000 out of \$78,000,000 deposited on the risks represented in the New York report, or \$28,000,000 out of \$100,000,000 which was probably paid for insurance in the United States and Canada in 1884, or such part of such sums as your risks in Boston bear to the whole? What sum of money

are you ready to spend in improving your risks in providing apparatus and water supply? In other words, are you and your landlords prepared to insure yourselves to the utmost of your ability? Is the prize of \$53,000,000 or \$68,000,000 a year, now waiting to be saved, a sufficient inducement for each of you to do your own proportionate part of the work? If not, you had better give up your present enterprise and submit to an advance in the rates of stock insurance of at least 20 per cent., in order that stock companies may give you contracts safe for you to take and safely carry your risks as they are now.

You need not expect to help yourselves by substituting the title of "mutual" for the title of "stock," or by substituting a guarantee fund for a capital, if you then go on in the old way, betting that bad risks will not burn. You may save on expenses during the first lucky run of your company, because you will take your own risks to the office, instead of waiting for an agent or broker to come to you; but, in the long run, you cannot expect to save in this way any greater sum than would be saved if no commission were paid by the Aina, Hartford, Home, the Insurance Company of North America, the Continental, or by the great foreign companies, whose business is conducted with great skill and at a minimum of expense on the stock method. You may run up your mutual line of insurance like a rocket, but the stick is more sure to come down than the rocket is to rise if you don't make your risks safe. You must abate the dangers of combustible architecture; adopt the special safeguards which each risk requires; inspect your own risks and hold all your employees to a stern account, and, when you have taken every precaution that wit or wisdom or practical sagacity and experience can devise, you may safely combine for mutual insurance, and not before, with an expectation of saving the entire value of your property in one generation by the accumulation of your profits.

This gigantic evil can only be met by heroic treatment. You cannot "fiddle" with it while your property is burning or in imminent danger of burning. Your problem is more complex and difficult than the protection and insurance of factories, because, as a rule, the factories are so widely separated from each other that no single fire could occur, outside of a very few places, by which a single fire would take the whole of our annual premium. But in the three or four cities where several risks are in proximity to each other the double or treble water supply, the complete connection of all the pumps and pipes, the effective organization of all the men and other safeguards, have rendered the record of loss even lower than that of all the rest of our business. In the great factory cities of Manchester, Lewiston, Saco and Biddeford, Lawrence, Lowell and Holyoke, where we have the greatest concentration, the cost of insurance has been less than fifteen-hundredths of 1 per cent., including all losses and all proportional expenses. This shows you what you can do if you choose. What are your conditions and how do they compare with the long range of factories in these cities which I have named? What organization is needed to provide, first, for safety; second, for indemnity. I will take a given square in a neighboring city as an example; it contains about 400 x 250 feet, or 100,000 square feet of ground. In a rough-and-ready way we may compute this area of ground as being covered with buildings to the extent of 80 per cent., five stories high, giving 400,000 square feet of floor, separated by numerous party walls. This area could be fitted with 5-inch standpipes, with hydrants on the roofs at each party wall, capable of flooding each building, at a cost not exceeding \$3000, these hydrants to be supplied from the high service. (Flooding is a rough remedy for existing irreparable faults of construction, and is only a final alternative when other methods have failed.) This block could obtain a second supply of water, and could be fitted with a steam pump of ample capacity for the service of its own hydrants at a cost not exceeding \$2000, and every square foot of the 400,000 feet of floor could be protected with automatic sprinklers, which also serve as the most certain automatic fire alarm, at a cost not exceeding \$16,000. Add for contingencies \$4000, and a total of \$25,000 is reached—substantially \$2500 per acre of floor, a little over 6 cents per square foot, for the most complete protection of every foot of floor on land which is worth \$30 per foot for the ground only.

Now, gentlemen, what is the combustible value of these buildings and their contents? Again, in a rough-and-ready way, we may compute the buildings at \$10 per foot of ground—\$1,000,000—and I have good reason to believe that the contents are worth at least \$5,000,000, making a total of \$6,000,000, on which the annual premiums for insurance at present rates would be over \$500,000, some of the occupants paying 1 1/2 per cent. on open stock.

At these estimates the value of the property in this square is:

Land	\$3,000,000
Buildings	1,000,000
Goods	5,000,000
Total	\$9,000,000

The sum of \$25,000 expended in the manner described would not only render any very serious loss in this block a remote contingency, but would render the block itself a barrier to the spread of a conflagration.

It will be observed that the safeguards which would be advised in such a case as this would cost less than one annual premium on the same property, and ought to be adopted without any reference to the contract of insurance. But let us see how such an investment would pay, even in the saving of the premium on policies, if this and other squares or blocks of the same kind were combined for mutual prevention of loss by fire as their principal purpose and for payment of indemnity in case of loss as a secondary incident. According to the experience of the companies reporting in New York, the sum of premium paid would be divided as follows:

Expenses	37 per cent.	\$18,500
Losses	64 per cent.	\$22,000
Total	101 per cent.	\$40,500
the 1 per cent. over being on from reserves.		

\* An address by Mr. Edward Atkinson, delivered before the Boston Merchants' Association, February 16, 1885.



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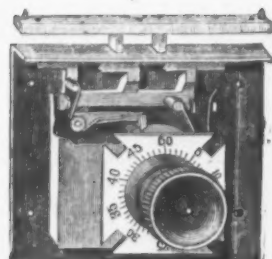
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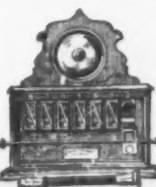
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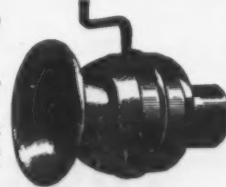
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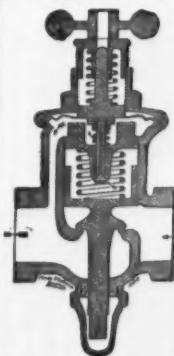
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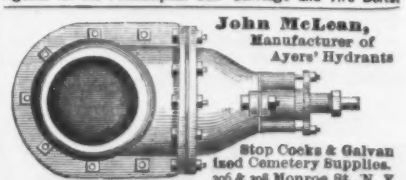
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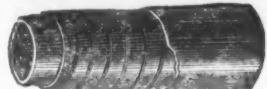
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Expenses, at least 17 per cent., or \$8,500  
And in loss, 23 per cent., or \$11,500

Total saved \$20,000

You will observe that even if the saving were only what I have named the profit on the investment for self-protection costing not over \$25,000 would be in a single year \$20,000, or 80 per cent. Suppose this saving represented by scrip. You can judge what the business of an insurance company making scrip dividends of 40 per cent. on its premiums would be by looking over the annual return of the Atlantic Mutual Marine Insurance Company, of New York, for the last 10 years.

It is only the first step which costs a little money. Your principal difficulty will be in bringing about the full co-operation of owners and occupants and in removing from the minds of the assured the ordinary sense of opposing interests which commonly exists between the assured and the underwriter. If your object is mainly a hedge about rates, and if you expect to obtain permanent contracts of indemnity at less than cost, you had better wind up before you begin. Your own premiums, whether in a stock or mutual company, are the fund from which your indemnity is to come, and this fund must be kept up to the full standard of losses and expenses in either case. If you form this organization all your members will be substantially copartners. One of the essential features of your organization should therefore be to devise a method of listing all the original members—not alphabetically, but by cities and streets, or fire districts, furnishing each member with a list of the names thus assorted. After that, distribute a list of names added or dropped in each street or district monthly, and once a quarter and once a year print a complete list of the members by name and by the district, as it may be agreed to define the district, with a statement of the amount at risk in each of said districts. Every member of a mutual company is entitled to know who his partners are, and where there is so much liability to an undue increase of hazard in a particular section of a city the utmost care should be taken to give every member a method of measuring his share of each district hazard.

Now, as to your organization. You cannot afford to trust to men, however capable, who have had no experience as underwriters. Your first necessity is a competent head—a man peculiarly gifted in the art of saying "no" and at the same time convincing the applicant that he ought to say "no." You need a head inspector who should be a first-rate builder, experienced in the construction and protection of factories. You need another man trained in a scientific school and capable of dealing with pumps, pipes, hydrants, electricity and other similar appliances. All these men can be readily named, and for the subordinate places capable men are unfortunately too numerous. Permit me to add that if you were contemplating a strictly mutual company for the insurance of miscellaneous city risks, of which each member would become liable to an assessment, I should advise against it. But your plan is as truly a mutual one if you combine together, first, to make your property safer.

Second, to accumulate the profits of insurance at adequate rates in such a way that the fund thus saved shall become a guarantee fund for the benefit of the assured, represented by the interest-bearing scrip divided yearly among the members. I am grateful for the opportunity you have given me to address you. The subject interests me as underwriter, as a tax-payer subjected like every one else to my share of this malignant fire tax, and as a student of social and economic science.

## English Letter.

(From Our Regular Correspondent.)  
LONDON, March 9, 1885.

THE WEEK

has been devoid of features of special interest in a commercial sense, and we are in no-wise better off than we were. Politically, we are a trifle easier since Prince Bismarck has had his fling at Lord Granville, and our Foreign Minister has had his say. As to the dispute in Afghanistan, there is a pretty general opinion that Russia does not mean fighting just now, although she might, perhaps, have gone on advancing her outposts had not the outcry been made in good time. Domestic politics are of no great importance as affecting the trade barometer, but it appears to be accepted on all hands that we shall have a general election in the autumn, probably in November. That will disturb affairs for a couple of months or so when the time comes—meantime "sufficient unto the day is the evil thereof."

In reference to the Government purchases of American machinery for the railway between Suakim and Berber, in the Soudan, there has been much outcry and complaining during the week. This was to have been expected, when one bears in mind the great depression of trade at home, the keenness of competition and the incidence of your tariff upon our manufacture. As a good deal of feeling and nonsense have been imparted into the discussion on this head, I turn to your contemporary, the London Ironmonger, for the facts. These, in brief, appear to be that the British Government, having arranged for a railway, let the contract for the water supply to be ranged alongside it to two gentlemen. These gentlemen are Mr. Edwards, chairman of James Russell & Co., Wednesbury, and Dr. Tweddle, an American gentleman domiciled at Paignton, in Devonshire. Mr. Edwards undertook the tubes and pipes, while Dr. Tweddle had the pump orders and the general superintendence. Having had abundant experience of pipe lines in the States as well as in the Caspian district of Russia, Dr. Tweddle very naturally resolved to resort to the pumps he had previously used with success. Consequently he ordered six pumps, each of 18-inch steam area, 5-inch water area and 18-inch stroke, from Messrs. Worthington & Co., New York, prompt delivery being a leading feature of the order. This was not

asking Messrs. Worthington for more than they were prepared to do, for the first has already arrived, two more are on the way and the other three await orders. The cost is £600 to £700 each. Deliveries are to be made at Woolwich Arsenal, where the pumps are to be tested before being shipped to the East. These pumps will suffice for the first 50 miles of the railway track. If more are wanted, the pumps, &c., will be bought at home if possible—notwithstanding which the London house of Messrs. Worthington is not in despair as to the further orders. It is generally supposed, however, that not more than 50 miles will ever be laid, so that there need be no special anxiety on the subject. When the news first transpired that the Government had bought pumps from the States the outcry was loud. Now, however, Mr. Richard Tangye, a prominent supporter of the present Ministry and a relation by marriage of Mr. Chamberlain, has written thanking the Government for buying in America on the ground that sufficiently powerful pumps are not kept in stock in England and could not be made under several months. Mr. Tangye's facts may be right; still his letter strikes me as being exceedingly funny under the circumstances.

The Board of Trade returns for February, issued to-day, are very discouraging, and show that we are not only buying vastly less raw material, but also much smaller quantities of food and drink. On the export side of the accounts there is a large decrease in almost every one of our leading manufactures, and especially in metals and textile goods. These statistics, therefore, amply confirm and emphasize the current and recent reports of the dullness of trade. I give you the leading figures of the returns lower down. In political and certain social circles here there is a good deal of talk, and some indignation, about the blackballing of Mr. Andrew Carnegie, of Pittsburgh, at the reform club. Mr. Carnegie was proposed by Mr. Dadds, M. P. for Stockton, but was "pilled" in the most merciless manner. As you may know, a very limited number of black balls defeats a candidate. In Mr. Carnegie's case the black balls were very numerous. It is supposed that the defeat was meant more for Mr. Dadds than for Mr. Carnegie, but it may have been intended for both, as the "Reform" is notable for its Whiggism, whereas Mr. Carnegie is known to hold very advanced opinions. The fact may be that one of the numerous cliques at the club resolved to "pill" the American candidate, and did so to gratify themselves rather than to discredit the would-be member. Mr. C. will probably recover from this petty snub.

## THE IRON MARKET

has remained quiet this week, and, like all other commodities and securities, has been somewhat adversely affected by the unsettled state of political matters. There is a moderate amount of business in hand at most of the works, but the open market is very dull, and there seems to be no prospect of an early improvement. There is nothing in the outlook to promote or encourage speculation; consequently, almost all classes of consumers are buying from hand to mouth, and are doing so in the most cautious manner, so as not to anticipate their actual requirements in the slightest degree. With any change for the better this ultra caution would be likely to disappear, and considerable advantages would accrue to all branches of trade. I have now the full text of the address issued by the American Iron and Steel Association, and find it decidedly optimistic in tone. It is clear that the improvement is only prospective. At Glasgow there were numerous transactions in warrants early in the week, and values had further improved (owing to the much better shipping returns), but the closing price was only 41/3 p ton. Stocks are still increasing, and the competition of Cleveland pig is severe. In Scotch makers' brands there has been scarcely any variation in values during the week.

At Middlesboro' the weak tone of the market has not been improved by the official returns for February, which show a large increase in stocks and other unfavorable features. For No. 3 about 34/6 is asked, but sales are being made, it is said, at as low as 34/ p ton. The local consumption is below an average, and the foreign shipments are not up to the mark. With the opening up of the northern navigations an improvement in the latter respect may be anticipated. On the West Coast hematite pig iron remains sluggish at about 44/ for mixed lots in usual proportions. The smelters are averse to making large forward sales, under the impression that values are now unduly low, yet some of them have done so in the face of the large make and growing stocks. In the other smelting districts crude irons are weak and irregular, all the advantage of the situation being with buyers, particularly where large lots or prompt cash are factors in a transaction. The heavy iron works are fairly engaged, but scarcely any activity prevails. In fencing wire and galvanized sheets there is a moderate turnover, but values are greatly depressed and there are deep complaints of the severity of current competition. In ordinary finished iron there is little that is new to report. Some of the sheet mills are fairly employed on tin and working-up orders. The demand for bars runs largely on the cheaper grades, and the northern makers are competing very closely with the Staffordshire producers, a good ordinary bar being obtainable at from £5, 7/6 to £5, 12/6 p ton. For hoops, angles, strips and railroad iron the call is quiet. Old materials are in some cases a trifle better. I quote: Old double-headed iron rails, £2, 13/6 to £2, 15/; No. 1 heavy wrought scrap, £2, 2/6; old boiler tubes, £2, 5/ to £2, 7/6; old cast iron, £2 to £2, 2/6; old leaf-spring steel, £2, 5/ to £2, 7/6, all f.o.b. London or other good British ports. Freight rates are nominal, pig iron from Glasgow or Liverpool to New York by ordinary steamers being 1/ @ 1/6 p ton.

According to Edwardes, Robertson & Co., Cardiff, tonnage thence to American ports is easily obtainable at about 7/ p ton. Eastern rates are steady, owing to the large amount of tonnage taken up by the Government. Steel is without changes to note, there being no vitality in any branch of the Sheffield trades except in those devoted to large forgings, special castings and the best



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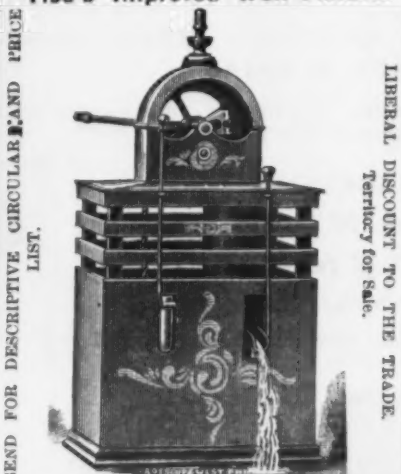
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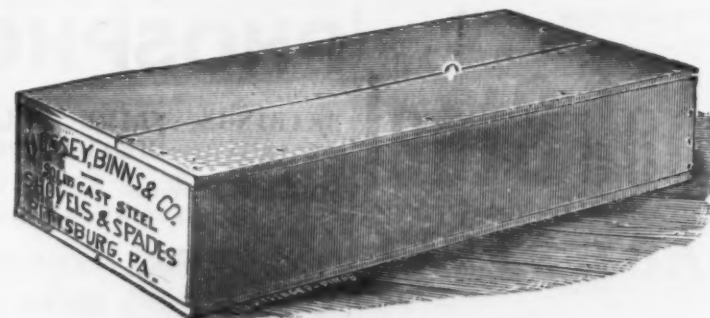


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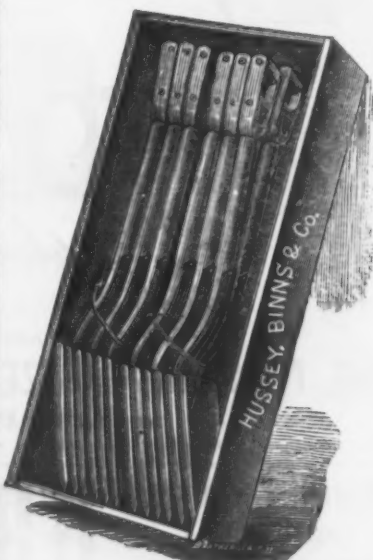
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New York Safety Steam Power Co., New York:

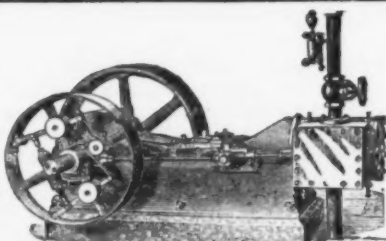
DEAR SIR:

The 12" x 12" Horizontal Engine which you sent us nearly one year ago has been in continual night service ever since, with the exception of a few nights each month. We find it drives three No. 7 Brush Arc Dynamos with steadiness and economy, and so far has required little or no repairs. It is belted direct to the dynamo and makes about 240 revolutions per minute with 80 lbs. steam pressure at the boiler, developing about 66 H.P. The Dynamos supply current for 150 Brush Arc Lamps of 1000 candle-power, and furnish satisfactory Street Lights for this city.

Yours very truly,

(Signed) BRUSH-SWAN ELECTRIC LIGHT CO.,  
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The productions of this company have been in the market for fifteen years, and enjoy the reputation of being eminently first class.



Horizontal Automatic Cut-Off Engine, 25 to 200 H.P.

OFFICE OF THE NEW YORK STEAM CO.,  
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N. Y. Safety Steam Power Co., 30 Cortlandt St., N. Y. City:

GENTLEMEN:

We have had in use one of your 8" x 9" Horizontal Automatic Cut-off Engines since June 26, 1884, operating Dynamos supplying 60 to 100 Incandescent Electric Lights both day and night. The engine was used also for a short time in making tests of a 300 Electric Light Dynamo machine, and developed for a portion of the time thirty-nine and four-tenths (39.4) horse-power. The engine has operated to our entire satisfaction.

Yours very truly,  
CHAS. E. EMERY, Eng'r and Supt.

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sorts of tool and engineering steel. The Bessemer and Siemens works are fairly engaged on rolled sorts, billets, &c. In Scotland the producers of steel ship plates and angles have further advanced prices by 5 p ton, making a total increase of 7/6 p ton within the past few weeks. The stronger tone of this branch is owing to the improved demand for steel shipping. Steel rails are unchanged at £4. 15 p ton for ordinary heavy sections. A few small orders continue to be given out, and the majority of the mills are running, but the heavy producing power of the country is only indifferently occupied on the whole.

### SCOTCH PIG IRON

has not been quite so strong, owing to the political complications and the absence of strengthening elements in the market, not to mention the increasing stocks. Last week's shipping returns were good, but those issued to-day are less favorable. The number of operative furnaces is now 93, against 97 a year ago. In Connal's stores there are 587,843 tons—an increase of 825 tons last week—as compared with 593,669 tons this date in 1884. Shipments to date are 13,183 tons behind, while the pig-iron importations from Middlesboro' into Scotland have increased by 26,616 tons this year. Current prices are:

Deliverable alongside.	No. 1.	No. 2.
Gartsherrie, at Glasgow.	32/	46/9
Coltness, "	35/	50/6
Lanlochan, "	51/6	51/
Summerlee, "	51/6	46/6
Calder, "	52/	46/6
Carnbroe, "	48/6	47/
Clyde, "	47/	46/
Monkland, "	42/6	40/6
Quarter, "	42/3	40/
Govan, at Broomielaw.	42/6	40/6
Shotts, at Leith.	51/6	51/
Carron, at Grangemouth.	47/	47/
selected.	specialty	32/6
Kinnell, at Bo'ness.	41/6	48/6
Glenarnock, at Ardrossan.	48/6	43/
Eglington, "	49/3	40/
Dalmellington, "	47/	48/6

### MIDDLESBORO' PIG IRON

remains exceedingly dull and depressed, owing to the growing stocks and indifferent demand. Current rates for G. M. B. are:

No. 1 Foundry.	37/6	Mottled.	32/9
" 2 "	36/	White.	32/6
" 3 "	34/6	Refined Metal.	50/
" 4 "	33/9	Kentledge.	36/6
" 4 Forge.	33/3	Cinder.	31/6

The official returns of the Cleveland Ironmasters' Association for February show that the total make of pig iron in the district in February was 180,323 tons, against 202,225 tons in January. The stocks were 377,737 tons, an increase of 6320 tons; and the shipments 63,456 tons, against 59,148 tons in January.

### THE BOARD OF TRADE RETURNS

for February are very unfavorable, as I have said already. They show a decrease in the imports of £7,142,359 compared with February, 1884, and a decrease in the exports of £2,058,159. The imports were worth £29,458,642, and the exports £16,850,218. The principal items of export during February to the United States were as under:

Articles.	Month of Feb., 1885.	Month of Feb., 1884.	Month of Jan., 1885.
Alkali, cwt.	214,287	285,591	312,787
Hardware and cutlery, £.	2,442	29,359	29,573
Iron—Pig, tons.	4,882	10,969	7,195
Bar, angle, rod, &c., £.	65	233	177
Railroad, all, tons.	21	3,766	216
Hoops, sheets, plates, &c., tons.	210	499	846
Tin plates, tons.	13,225	17,274	15,738
Cast or wrought, tons.	62	302	159
Old, tons.	500	3,636	856
Steel, unwrought, tons.	517	896	1,125
Lead, all sorts, tons.	102	14	30
Steam engines, &c., £.	1,242	1,755	2,738
Other machinery, &c., £.	16,517	27,521	17,879
Tin, unwrought, cwt.	690	60	20
Special return—Iron rails, tons.			
Steel rails, tons.	20	3,621	161

### TIN PLATES.

In London there has not been so much doing on American account, so the market must be described as quiet, although there is a fair inquiry reported for the Continent and Australia. Most of the works are fairly well employed, and makers are not open to book orders for IC cokes below the price named by me last week, viz., 13/9 @ 14/1, f.o.b. Liverpool. At Liverpool the demand for tin plates does not improve very much, and there is but little movement any way. It seems as if there is no very great anxiety on the part of buyers to deal very much in futures, and take up big lines for forward delivery many months ahead. There is now evidently a tendency to recede from the slightly better figures that were paid a few weeks back. The ordinary business done in the general run of coke tins has been but small, though there has been but small orders for specialties in sizes and substances for which there seems to be a general demand. It is these orders which have kept the market from being absolutely flat and depressing. Prices of ordinary coke irons are still quoted at 14/ @ 14 3/4, but neither of these figures is obtainable except for something specially good. Coke tin wasters maintain their ground remarkably well, and good brands in 14 x 10 and 14 x 20 sizes still command 13/3 and even 13/6, while others are to be had at 13/1. The demand for these has been very good; of late and continues so this week. In steel plates again things have become very quiet, the inquiries are but few and not many orders have been secured. Buyers are evidently aiming at lower figures than they paid recently, before placing any more of their orders. So far, however, there is no inclination to give way on the part of makers—those who are well situated as to their order books for the present, at any rate. The only point now in doubt is as to how long this state of affairs will last on their part, and whether they will have to seek for orders before further business will be offered them by buyers. If not, then prices will not recede, but will be maintained, and perhaps be better. There is very little actual business to record this week either in Bessemer steel or Siemens steel plates with coke finish. Orders at 14/ IC for the former and 15/ IC for the latter have been refused of late, but it is doubtful whether such figures could now be obtained, though the quotations continue at 14/3 @ 14/6 IC and 15/3 @ 15/6.

IC. There are only occasional orders to hand for charcoal tins this week, and these do not amount to very much. Prices are about 16/ @ 17/ IC and 17/6 @ 18/6 for best charcoal tins. There has also been much less doing in tines of late, and, unless the trade is going to stop altogether, a better business is bound to come in very shortly.

### TRADE PUBLICATIONS.

#### Pneumatic Hammers.

We are indebted to Messrs. W. J. Player, Birmingham, England, for their 1885 catalogue of patent power hammers, steam engines, machine tools, &c. The special tools described in this book of interest to our readers are the movable-fulcrum pneumatic hammers, which are illustrated. These hammers are worked by a belt over pulleys which drive a rocking lever, one end of which is attached to a crank disk, and the other end to the hammer-head. This lever works on a movable fulcrum, the position of which can be easily shifted by a side movement of either of the varying foot levers. When the fulcrum is moved toward the hammer-head the stroke is reduced, and consequently the blow dealt is a light one; when moved toward the crank it is lengthened and the blow correspondingly increased. Thus it will be seen that both light and heavy blows are given at the same rate of speed of delivery, an advantage which the makers claim is possessed by no other appliance for the same purpose. The hammer is started or stopped by means of a foot treadle which is worked by the attendant, who easily regulates with the same foot the force of the blow, thus bringing the hammer under the complete control of a single workman. The pneumatic principle is applied so as to allow for variations in the thickness of the material operated on and to prevent all jarring to the mechanism. Hammers are shown in the catalogue adapted for small planishing and of a style that would be useful in a cornice shop for smoothing out the edges of sheet metal cut with snips; also heavy planishing hammers and hammers for various purposes—varying from very small ones up to forging hammers—for blacksmiths' use, and heavy hammers for special lines of manufacture.

#### Punching Presses, &c.

We have received from Messrs. Taylor & Challen, of the Derwent Factory, Birmingham, England, their catalogue of drawing presses, punching presses, rotary shears and other special tools used by manufacturers of sheet-metal work. A number of special attachments are shown to the presses illustrated, among which may be mentioned feed rolls, by which blanks are fed into the machines automatically at a speed to correspond with the cutting dies. While the engravings show the various tools in a very satisfactory manner, we learn from the catalogue that the manufacturers circulate photographs as being more satisfactory for indicating the true nature of the machines they furnish. The different cuts in the catalogue contain memoranda of the photographs by numbers that show the same work.

#### Metal-Working Tools and Machinery.

We are in receipt of a descriptive, illustrated catalogue and price list, dated January, 1885, issued by Israel H. Johnson, Jr., & Co., 1422 to 1426 Callowhill street, Philadelphia. The pamphlet is very attractive in its general appearance and contains about 100 pages, well printed and handsomely illustrated. The tools shown embrace various sizes of foot-power and belt lathes, engine lathes, milling machines, cutting-off and centering machines, chucking lathes, drilling machines, punching and shearing machines, boiler rollers, screw presses and various specialties. Sufficient descriptive text accompanies each engraving to fully explain the features of the tool represented.

**The Cost of Rails in Germany—Dr. Wedding.** In reviewing the iron and steel trade in Germany, Dr. Wedding discusses the capacity of the rail works of that country for competing with foreign rivals in the markets of the world. To illustrate the progress made in the reduction of cost he quotes the following figures as having been elicited in 1879 by a Government inquiry. Exclusive of interest and sinking fund, the cost of rails at different German works was as follows during that year:

Works.	Materials, Marks.	Wages, Marks.	General, Marks.	Total, Marks.
Koenigs-und Laurahutte.	221.70	3.80	17.50	143.00
Union Dortmund.	87.96	9.12	12.67	109.75
Bochum.	85.85	9.43	25.13	122.60
Phoenix.	114.54	7.80	3.36	125.00
Maxhutte.	122.30	10.40	6.49	140.00

At the same period, Dr. Wedding asserts, the cost at English works was not more than 120 to 125 marks, and in some cases only 102 marks. Now the cost at all of the German works has fallen to about 90 marks, while in the Cleveland district, England, they are 34.70 marks. Dr. Wedding attributes this relatively greater decline in the cost of manufacture in Germany to two causes. The duties introduced in 1879 put the German works into the position of holding the home market at fairly remunerative prices, and to compete in the markets of the world at much lower figures. Formerly the reverse was the case, when Germany was a market open to all. Then the prices were lower there in proportion to the freights to point of delivery. In consequence of the certainty of a market, the production could be increased and general expenses were reduced. Another cause for the lowering of the cost of production was the introduction of many improvements in the technical details of manufacture.

Henry A. Newman, of Missouri, has been appointed a special agent of the Labor Bureau. He was formerly chief of the Missouri Bureau of Labor Statistics, and is regarded as being peculiarly well fitted for the duties of his new position.



# The Iron Age

AND  
Metallurgical Review.

New York, Thursday, March 26, 1885.

DAVID WILLIAMS, Publisher and Proprietor.  
JAMES C. BAYLES, Editor.  
JOHN S. KING, Business Manager.  
CHAS. KIRCHHOFF JR., Associate Editor.

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SOLE AMERICAN AGENCY FOR

THE IRONMONGER,

Published at 42 Cannon St., London.

The oldest and leading representative of the British Iron and Hardware Trades.

Subscription, Postpaid: \$5.00

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Selling Below Cost of Production.

An argument that is being daily used as an inducement to bring about sales is that goods offered cannot be made at less than the figures quoted. If it is true that exceptions prove the rule, then the cost of production must be the minimum selling price. The exceptions are certainly numerous enough, and the frequency with which buyers have noted them may well have weakened their faith in the infallibility of the rule. It is somewhat surprising, and yet we have observed it in a number of instances of late, that producers make very serious errors in arriving at what they believe to be the cost of production. One case which we recall is that of a nail mill prominent in cutting prices for a long time. We understand that this course was followed because the managers, after a computation, had arrived at the conclusion that a certain figure represented their cost, and so long as the basis of sales was apparently above it they continued to make things uncomfortably hot for their competitors. When the end of the year came around the managers discovered, much to their surprise and chagrin, that a prospective profit had been converted into a decided loss. They have since mended their ways. There are undoubtedly a multitude of contingent general and unforeseen expenses of all kinds which turn up at the annual balance, and which it is only too generally customary to make no provision for in estimates of cost. The tendency is evidently toward underestimating; but even when liberal allowances are made and the cost of production is put up to an absolutely safe figure, it does not by any means follow in all cases that a lower price is not accepted. Leaving aside those instances where a fight for control of a market thrusts aside all other considerations, there is a large class of transactions knowingly entered into by the producer at a loss. Additional orders may be wanted to fill up a gap, or they may be taken with the object of keeping together an

organization which it would be difficult and costly to recover when it had been scattered after a period of idleness. Business may be closed at a loss to acquire new outlets or to defend old-established markets against encroachment. One of the strongest incentives to submit to present loss is the fear of giving competitors an opportunity, while the works are idle, to enter into close business intercourse with old and valued customers. This is strengthened by the opinion, generally and justly held, that in times of depression and close buying customers have every motive to pay attention more strictly than usual to quality.

To some extent the readiness to sell below cost of production depends upon the manner in which an enterprise is organized and managed. If it is a stock company with largely scattered ownership, officered by men who are drawing large salaries, while their stake in the concern is comparatively small, it will go on producing and selling in spite of loss. Needed repairs will be persistently neglected, all but absolutely necessary expenditures will be avoided, and quality of product sacrificed unmercifully to continued tenure of office. If it is a concern owned by private individuals the sanguine temperament of the leading spirits may lead to carrying on a losing business far beyond the bounds of common prudence.

Another cause which has its effect upon selling below actual cost of production is heavy general expenses, which go on whether work continues uninterruptedly or whether the concern is idle. This is notably the case in mining, where pumping forms a heavy continuous expenditure, or where the ground must be kept open by heavy timbering. Some manufacturing enterprises, too, are so constituted that stoppage of work and resumption of it mean a very heavy expenditure. This is notably the case with blast furnaces. Blowing out and blowing in are costly, and it generally takes the pressure of some sacrifices before stoppage of work is decided upon.

All these considerations obtain still further significance with concerns who are weak financially. Hoping against hope, they struggle on, getting deeper and deeper into the mire, until at last they are forced into suspension by the exhaustion of credit and every other resource. It is notorious what sharp and reckless competitors such struggling enterprises are. They are the most dangerous slaughterers of prices, and it is needless to say that with them the relation between cost of production and the selling price is utterly disregarded. It need not be a matter of surprise, therefore, that instances are numerous where the selling prices are actually below the cost of production. This is the natural result of every depression and generally marks its end. The causes which we have enumerated tend to make the struggle more intense. They contribute, however, as a heroic cure, to bring about a more rapid return to a sound basis. The cessation of the desperate efforts of the weak and crippled is generally the sign of a return to more prosperous times. The recovery, it is well known, is usually slow and tedious till the point is reached when the deferred demand suddenly asserts itself.

The evils which we have pointed out are only too well recognized in the iron, steel, metal and hardware trades. The question which naturally forces itself upon the mind of every one engaged in the business is whether or not the critical point has been passed. There is much which at first sight is well calculated to shake the belief of the most sanguine. Hardly a week passes but what there come reports from one quarter or another of the closing of transactions at unprecedentedly low figures, and it would be idle to deny that they make a deep impression. On the other hand, it must be noted that the leading articles have for months been steady, that all the pressure brought to bear upon them has not caused further concessions, and that in a few isolated instances better prices have been insisted upon and have been obtained. With goods on their hands bought at the lowest figures, there will always be sellers who are ready to sacrifice a part of an advance, so that recovery must necessarily be very slow at first; but a careful review of the situation as affecting the near future seems to indicate that there will be less selling below cost. It seems as if the causes which have led to transactions at a loss have well-nigh spent their force.

The "conspiracy" between the employers and employees of the nut and bolt trade to maintain prices of both product and labor, to which we referred some time since, seems to be in full operation in England. Recently a mass meeting of the workmen in the nut and bolt works was held at Darlestone to consider the refusal of a firm in that town to join the employers' association, and the consequent refusal on the part of the employees to join with their associates. It appears from addresses made at this meeting that all the firms in the district except five or six had joined the employers' association, and that all of these had expressed their willingness to do so except one, employing 24 men. It was also reported that 100 men were on strike and receiving strike pay pending the completion of the arrangements between the employers against whom they struck and the employers' association. At this meeting resolutions were passed urging the men to use every legal means to compel their fellows to go out and remain out until their employers joined the association. This certainly is an unwelcome condition of

affairs, and one that under the conspiracy laws existing in many States could not for a moment exist in this country. Nor do we believe that any very large number of our employers could be induced to enter such a combination. While no doubt it has its good features, the injury that it would entail in certain directions would be too costly for the gain that would result. The strength of it is in the power of the workmen to compel, by striking, recalcitrant employers to enter the employers' association and maintain rates. Unless the English workmen who are its members are much more wise and judicious than their fellows in other trades and in other countries, they will not be slow to use this power to compel the payment of even larger wages than they are now receiving, and the same power that succeeds in one case will probably succeed in the other.

## Lake Superior Copper Mines in 1884.

With the exception of a few mines in the far West, which one could count on one's fingers, and isolated cases of coal mines in the East, the most elaborate and valuable annual reports published are those of the leading copper mines on Lake Superior. We turn to them with special interest this year because they furnish some data upon which it is possible to form a pretty clear idea concerning the capacity of many of the mines to produce at current rates for the metal. While it is true that the Lake Superior mines have ceased to hold that commanding position in the copper markets of the country which they had maintained for so many years, they still produce a very heavy percentage of the metal made, and largely shape events. The following table, giving the production for a number of years of the whole country and of the Lake Superior mines, in net tons, will show how relatively the importance of the latter declined:

Year.	Total production.	Lake Superior.	Per cent.
1870.....	14,112	12,311	87.2
1875.....	30,100	18,020	59.8
1879.....	35,700	21,434	59.8
1880.....	30,340	24,968	82.3
1881.....	35,840	27,286	76.1
1882.....	45,323	38,491	84.9
1883.....	57,730	39,831	69.0
1884.....	70,807	34,250	48.4

From a percentage of 87.2 per cent. in the year 1870 the Lake Superior mines declined to 48.4 per cent., in spite of the fact that their output grew from 12,311 net tons in 1870 to 34,250 tons in 1884, nearly trebling in that period. It is not our object to trace at the present time the causes which led to the rapid development of copper mining in other quarters. Their effect has been only too evident in the constant decline in the values for the metal, and in the growing quantities shipped to foreign countries. The producers in the old Lake district have attempted to meet the decreased earnings per pound by first increasing the output, and then by reducing costs in every possible way.

The outcome of the efforts in the first direction will be apparent from the following table, giving the product of the leading mines in net tons during the last three years:

	1882.	1883.	1884.
Calumet and Hecla.....	16,025	16,563	12,059
Quincy.....	2,838	3,006	2,840
Osceola.....	2,088	2,128	2,124
Franklin.....	1,632	1,745	1,874
Huron.....	1,181	1,360	1,654
Atlantic.....	1,316	1,341	1,362
Central.....	677	694	718
Allouez.....	842	876	966

The principal increase has therefore come from the great Calumet and Hecla Mine, which in 1884 produced 58.3 per cent. of the total make of the lake, against 56.1 per cent. in 1882. The new equipment had not yet come into play in the year 1884, and it is estimated that in 1885, should they desire it, the managers can run up the product to about 24,000 tons. A number of the other mines have put in new stamps, and a few which were in process of development in 1882 and 1883 began to work up the capacity in 1884 too late to save their owners from sharp disappointment and heavy losses.

The effect of the depression on the cost of production may best be illustrated by the following table, which includes all the principal mines whose reports have been published thus far:

	1881.	1882.	1883.	1884.
Quincy.....	10.90¢	9.50¢	9.44¢	8.63¢
Osceola.....	12.97¢	12.21¢	11.34¢	11.24¢
Franklin.....	13.50¢	13.57¢	11.62¢	11.62¢
Huron.....	13.68¢	13.80¢	12.60¢	10.84¢
Atlantic.....	19.33¢	17.38¢	15.98¢	12.45¢
Allouez.....	19.33¢	17.38¢	15.98¢	12.45¢

\* Last three months, with three heads of stamps.

The factors affecting the cost are, of course, exceedingly numerous, prominent among them being grade of the rock and its hardness, the regularity of the dissemination of the copper in the vein, the extent of the ore bodies, the character of the hanging wall, &c. The two principal points, however, are the percentage of the copper and the hardness of the rock. There are two classes of veins—the harder conglomerate, and the softer amygdaloid, the old "mass" mines being practically out of the race. How widely the grade fluctuates may be appreciated by an examination of the following figures:

	1881.	1882.	1883.	1884.
Calumet and Hecla.....	about 4.5	4.5	4.5	4.5
Quincy.....	2.62	3.21	2.765	2.695
Osceola.....	1.29	1.21	1.214	1.169
Franklin.....	1.10	1.396	1.454	1.454
Huron.....	0.75	0.69	0.735	0.735
Atlantic.....	0.96	0.87	0.87	0.87

With a soft, amygdaloid and generally favorable conditions it is possible, therefore, like the Atlantic, to work rock yielding as low as 1/4 of 1 per cent. of copper. It does not, however, by any means follow, as a contemporary seems erroneously led to believe, that the management of other mines needs overhauling because it does not produce as cheaply in spite of the fact that the ore is twice or three times as rich. Thus the neighbor of the Calumet and Hecla, the Osceola, working on the same vein, though very carefully managed, does not do as well as the Atlantic, though the rock yields nearly 1 1/2 per cent.

It will be noted that, generally speaking, the cost of production at the different mines has steadily declined, and that in 1884 the cheapening was, on the whole, most marked. Yet with the exception of the Quincy, and of the Calumet and Hecla, and possibly the Atlantic, there is not one of the lake mines which can make money at current rates. While it is true that a further lowering of cost at some of the mines is to be expected, because additional plant, reductions of wages, &c., will only have their full effect this year, it may well be questioned whether any of the lake mines, with the exception of the three mentioned, can escape losses. It does not follow, however, that work will be suspended at the leading mines. Many of them have reserve funds, or can raise money by assessment or loans, and will go on in the hope that prices may recover. Nor should it be forgotten that the copper-mining pool, to which all the companies with the exception of the Quincy and the Osceola belong, sets aside a certain percentage of the receipts from sales of copper as a fund to help struggling members and to influence the market.

To the metal trade the question which is most interesting is whether or not there will be a very heavy falling off in the output in consequence of the fact that very few of the mines can meet the price of 10.5¢ to 10.8¢, at which manufacturers have been supplied during the first three months of the current year. We are inclined to believe that with the increase in the output of the Calumet and Hecla, the continuance of work at the Quincy, Atlantic, Osceola, Franklin and others, and with the quantities of copper which always are taken from mines leased to tributaries, the aggregate output will be very slightly decreased, if it is decreased at all.

## Stimulated Emigration.

The passage of the Chinese Emigration and the Contract Labor bills is the expression of a desire to correct a growing evil in connection with emigration. It is evident, however, to those who have studied the situation and are not blinded by prejudices that the Contract Labor bill will not cure the evil which was kept in view by the labor unions of the country when they demanded its passage. We question whether, outside of the padrone system, there is any importation of labor under contract such as the Contract Labor bill seeks to prevent. Some labor has been imported in the not remote past in connection with glass manufacturing at Kent and Zanesville, Ohio, and Baltimore, Md., but the number of laborers so imported has been exceedingly small. The real or imaginary evil of which the labor unions complain is that foreign workmen are imported to take their places in times of strikes. This is not so. The foreign workmen who accept the work rejected by strikers are not imported under contract. They are generally secured by the agents of the employers at the emigration agencies at Castle Garden. The whole trouble does not arise from contract labor, but is due to an overstocking of the labor market through emigration. If emigrants come over of their own accord, and are able to support themselves here, we do not see how legislation can prevent their coming. But when they are paupers and criminals, or when their departure from their native land is assisted or unduly stimulated in any way, then we believe that legislation can and ought to interfere. It is not wise or prudent from an economic or from a political standpoint to permit the overcrowding of our labor market. The suffering and misery entailed by such an oversupply of labor, and the menace to the peace of the country, are too great to permit it to go on unchecked. It leads not only to reduced wages, but to uncertainty of employment, with all the sufferings that condition of affairs entails. Those who have only come to this country to better their condition are too much inclined to listen to the seductive promises of demagogues, who urge that there will be an escape from low wages or little work in a change of social conditions. The spread of socialistic views among these emigrants in this country can largely be traced to the conditions that have grown out of our overstocked labor market. Such views do not make much progress among men of American birth, and the danger is consequently but slight so far as they are concerned. It is to be apprehended among that class who have been led to come to this country by the glowing accounts given them of the prosperity to be enjoyed here, and who are sorely disappointed by reason of the overcrowded labor market which they find.

In view of this danger it is certainly the part of wisdom that steps should be taken to prevent overcrowding and to hasten the advent of better times by placing restriction upon stimulated emigration. Other nations are taking action in this matter, now that the steamer rates invite eastward travel. The German Government is strictly enforcing the rule against persons of its own nationality that forbids people without visible means of support from landing in Germany. This is in effect refusing to receive

back returning emigrants who find after experience in America that they prefer their native land.

## The Central American Crisis.

The Nicaragua treaty and the attempt of the President of Guatemala to reconstruct a Central American Union by force of arms invest everything relating to that valuable portion of our continent with more than usual interest. The first Central American Union lasted from July 1, 1823, to the year 1840, when the compact was dissolved. Since then there have frequently been revolutions and warfare in and between the five independent Republics, not preventing, however, their growth in prosperity and population. The area and population of these Republics are distributed as follows:

	Square miles.	Population.
Guatemala.....	44,800	1,278,311
Salvador.....	7,900	558,882
Nicaragua.....	58,200	275,815
Honduras.....	47,100	351,700
Costa Rica.....	31,500	185,000
Total.....	179,500	2,644,708

Military Forces.

	Regular army.	Militia.
Guatemala.....	2,180	33,229
Salvador.....	1,400	18,500
Nicaragua.....	700	9,600
Honduras.....	843	31,500
Costa Rica.....	1,000	25,000
Total.....	6,123	117,829

The public indebtedness of Guatemala is \$8,203,092; that of Salvador, \$1,988,496; that of Nicaragua has just been paid off in full. Honduras owes \$750,000, and Costa Rica, \$6,258,629. The indebtedness of the Central American States is for the most part counterbalanced by the railroads owned by the Governments, especially in the case of Costa Rica, so that there are really no large public debts in individual States that would prove an obstacle to union. The desirability of reuniting the five Republics is acknowledged, we believe, throughout Central America. The productive power of this portion of the continent is something extraordinary. The volcanic soil, with the aid of sufficient moisture from both oceans, produces in a delightful climate all the staples of the tropics in great abundance, and of the very best quality. The population is laborious and sober. A portion of Central America—Salvador, for example—is thickly populated, and wages are low. Placed between the two oceans at a point where they approach each other nearest, and where great highways in the shape of canals and railroads are to link them together, the geographical position of the five Republics is unrivaled. Nor can their political future, even if but viewed from a strategical point of view, fail to become more important than any other portion of Spanish America, if we except the Columbian State of Panama, adjoining them. It must be evident, therefore, that in the interest of general trade, and of the United States in particular, this valuable portion of our continent should be composed of a powerful State, well constituted, and not subject to sudden revolutionary surprises and reactions, rather than by five small and weak nationalities, exposed to mutual invasion like the one now threatened by General Barrios. The only objection apparently to this consolidation, outside of Guatemala, is the manner of bringing it about. Three of the Republics decidedly object to the high-handed proceedings of Barrios. The attitude of Mexico, which has dispatched troops to Chiapas, the frontier, the concentration of American naval forces in Guatemalan waters, Atlantic and Pacific, and the war preparations in Salvador and Costa Rica, may suffice to cause General Barrios to desist from this ill-advised attempt to weld by force a consolidation otherwise so desirable.

General Barrios is a dictator, a man of great ambition and energy. In all material and intellectual matters he has advanced Guatemala in a striking manner, even his enemies must admit. But the dictatorial power he has used has made him enemies without number, even at home, and a year ago an attempt on his life was made in his own capital; he is more feared than beloved, and in this latest move is even forsaken by his own creature, De Zaldívar, the President of Salvador. On March 15, 1886, his term of office will expire. Baffled in this latest attempt to advance his ambitious aims, it is doubtful whether he will be re-elected in the ordinary course of events, for the Guatemalans themselves may consider him more an impediment to, than a promoter of, the re-establishment of a United Central America.

The general trade of Central America has vastly increased during the past 15 years, as a few figures will show:

	1868.	1884.
Central American Trade, Including British Honduras.....	\$1,271,351	\$6,424,018
Import.....	646,347	3,038,987
Export.....	625,004	3,385,031
Total.....	\$1,271,351	\$6,424,018

This shows that the general trade movement has more than quintupled.

Import into Central America in 1883.

From the United States.....	\$1,396,813
" England.....	8,617,591
" France.....	440,904

The bulk of importation from England has been dry goods, for of cotton goods alone it was in that year \$2,381,072.

American trade with Central America has developed as under:

Fiscal year.	Import.	Domestic export.
1883.....	\$5,121,315	\$1,396,813
1884.....	6,161,287	8,054,798

These figures show a notable increase in both directions. The chief articles of do-



mestic manufacture exported from this country to Central America the last fiscal year were: Ammunition and explosives, \$63,891; manufactures of iron and steel, \$614,705; leather \$61,780; beer, \$64,522; petroleum, \$68,818; provisions, \$187,072, and woodenware, \$200,270.

Considerable activity has been displayed of late years in railroad building in Guatemala and Costa Rica; the former soon hopes to establish a line connecting in a northerly direction with the Mexican system, and is also constructing a line from the Atlantic to the Pacific; Honduras has 60 miles in operation between Puerto Cortez and San Pedro; Nicaragua, 43 miles; Salvador, two small lines since 1882, and Costa Rica four lines of, together, 112 miles. As the Cordillera Mountain range forms a very elevated and rugged backbone running through the five republics, with an indenture only near Lake Nicaragua, there are great engineering difficulties in the way of railway construction; otherwise the Central American system would be more extended by this time than it is. To obtain the necessary funds from the United States and Europe is not such a difficult matter in view of the small amount of indebtedness of these Republics and the generally good opinion which capitalists have of their future. As matters stand it is evident that Central America is looking up in importance in a very marked manner, not only internationally, but also as a producer of certain leading staples, such as coffee. All the country requires is peace, and the unification may come naturally after a while without bloodshed.

#### Steel Nails and Steel Processes.

Notwithstanding the bitter opposition to them, steel nails seem to be rapidly winning their way. What one of the labor papers terms the "vigorous boycotting" of the steel nail by the carpenters and contractors of Wheeling appears to have had but little effect, as the demand upon the nail mills in the Wheeling and Pittsburgh districts is almost exclusively for steel nails. The iron-nail mills in those sections do but little work, and even the mills that make both steel and iron find that their steel nails move off freely, while for their iron nails there is scarcely any demand. As a result of this, steel nails are being made in increasing amounts, and even those mills which have heretofore refused to make steel nails, or have made them but sparingly, are making arrangements to very largely increase their product of steel.

The recent developments in the Clapp-Griffiths process have somewhat unsettled the views of nail manufacturers who have contemplated putting down steel plants in connection with their mills, and the results of certain experiments that are reported to have been made in the use of high-phosphorus pig in the ordinary Bessemer converter have had a further effect in the same direction. They have led them to the belief that possibly in the ordinary form of the Bessemer converter a pig iron higher in phosphorus than has heretofore been used can be employed with good results. We have heard a statement that iron made from a mixture containing 40 per cent. of cinder had been made into steel in the ordinary Bessemer method with a result truly surprising. It is also well known that very good results have been obtained at the works of the Pittsburgh Steel Casting Company by Mr. Hainsworth's process. The outcome of all this is that, while the necessity of entering into the manufacture of steel nails is recognized by Western nail men, and while they concede that they must ultimately have their own plant for the production of the steel, yet they will "go slow." They will investigate further and watch the results of these various processes and experiments before finally determining the nature of the plant they will adopt.

#### The Pig and Ore Process.

To the Editor of The Iron Age.—DEAR SIR: The trials at Bellefonte last fall for the syndicate for the purpose of testing Henderson's patent furnace were not completed, owing to delay in furnishing the necessary materials and a strike of the skilled workmen growing out of a dispute with the syndicate about their wages. Enough, however, was ascertained to give data as to probable cost of producing steel in this furnace by the pig and ore process when worked on a scale of production of 50 tons per day. The furnace at Bellefonte, Pa., holds conveniently but 1½ tons, although 2 ton charges have been made in it. The trials gave four melts in 24 hours, using pig iron and ore, which may be increased to five or six charges by taking the metal liquid from a blast furnace, and pouring it into the hearth, which, for economical work, should not contain less than 10 tons of metal. This procedure reduces the cost of labor to that of two melters, two engineers and two gas-producer men above the usual labor about the casting-house of a blast furnace, and, as these workmen are required about a Bessemer plant for the same purposes, the cost will be the same for these items as for working a Bessemer plant using metal from a blast furnace. The same may also be said as to repairs and refractory materials, so that the economy must consist in the saving of the waste of metal, fuel and use of lower grade of crude iron.

All of the experts in iron and steel making who saw the furnace in use agreed that the heat was sufficient for 5 tons of metal per charge, although not over 2 tons were used, because the furnace hearth and ladles would not contain it. The consumption of coal was more than had previously been the case because the retort in the producer was destroyed, it being made of wrought iron.

The effect was, in consequence, considerably lessened because the gases were not all utilized. This has since been remedied by making it indestructible and permanent, so that it gives gas enough to heat the metal for rolling in an adjoining hearth and to provide such a liberal supply of steam that steam will continually escape from the safety-valve of the boiler. Thus the average amount of coal used in the producer per day, 6720 pounds, is enough for turning out in that furnace at least 4 tons per charge with a larger hearth (although experts put it at 5 tons) and five charges per day with metal from a blast furnace. A ton of pig iron to 6 cwt. of Republic ore was used and an average gain of 3¼ per cent. of steel over the weight of iron charged was obtained and reported by the engineer in charge for the syndicate, with 610 pounds of slag containing 34 per cent. of metallic iron. Since a sand hearth was used the iron in the slag contains no more phosphorus than in the ore, so that it is as valuable for smelting as the ore per unit of iron. Gray forge pig iron was used, worth \$1.50 per ton less than the grayer grades of Bessemer iron.

The following is the comparative cost of producing steel by this process and by the Bessemer process, the iron for both being taken molten from the blast furnace. The average price of pig iron per ton for 10 years is estimated as the basis of the statement:

Henderson, with pig and ore	Bessemer.
Crude iron, No. 4.....	No. 1, 2 & 3.....
Manganese.....	Same.....
Superiority & labor same	Same.....
Repairs.....	Same.....
Coal, 8 to 4 cwt.....	Coal for boiler & spigot furnace.....
6 cwt. ore, at 40 cents.....	Waste, 12 per cent., average.....
Total.....	Total.....
Deduct 3¼ per cent. gain.....	
Val. of iron in slags.....	
Total.....	Total.....
Value of waste heat for heating for rolling.....	
Total.....	Total.....

If the Bessemer process is used with iron melted in a cupola, as is the general custom in this country, this difference is increased \$1.80 per ton, or \$6.04 in the aggregate, as follows:

3 cwt. of coke at cupola.....	\$0.37
Labor.....	.15
Repairs.....	.10
Waste, 5 per cent.....	1.18
Total.....	\$1.80

Another point of great importance developed by tests made by the Allentown Rolling Mill Company, is that the soft steel of Henderson's furnace is not improved by blooming and that steel made from Pittsburgh, coke and Cornwall anthracite pig iron tests 30 per cent. better quality than that tested by Kirkaldy, made at the Motala Iron Works, in Sweden, by the Siemens-Martin process, from the purest charcoal pig made in Sweden. Geo. Brooke's pig iron with .23 per cent. of phosphorus, gave better results cold bending than are got by the Bessemer process with pig of .1 per cent. of phosphorus.

Trials of Kemble pig carrying 1.12 per cent. of phosphorus, made on a basic hearth (iron ore), gave metal with less than .09 per cent. of phosphorus, dirt included. The sample contained considerable dirt that could not be separated. The cost of a furnace with ladles, cranes, ingot molds, &c., built complete for use, is about \$15,000 to make 50 tons of soft steel per day. If natural combustible gas is used the gas producer should be deducted from the cost—about \$1600. This gas is used in measured quantities with measured heated air.

OMEGA.

#### American Scotch Pig Iron.

The production of American Scotch iron and the inroads it has been making on the imported Scotch has been attracting considerable attention among manufacturers during the last two years. In the West it now looks as though the entire extinction of foreign iron is only a question of time, and for most lines of manufactured articles the time is not far distant. There are two substantial reasons for this preference. First, the cost of the American iron is much less; and, second, the relative value in quality is said to be equal in all respects where it has been carefully tried. Then, too, the advantage of having it always within reach is no small item to be considered, in connection with many other minor points, in a financial sense. Some interest has been manifested in different locations as to where the best American Scotch iron can be obtained, and from what ores it is produced. We take pleasure, therefore, in laying before our readers the following portion of a letter from an esteemed correspondent on these points. The author is thoroughly conversant with the manufacture of pig iron, usually very conservative in his opinions, and is connected with the Brier Hill Iron and Coal Company, of Youngstown, Ohio. He says:

"I promised you some time since to write you a chapter on 'American Scotch' pig iron. Absence from home and the press of other matters has prevented it. There is mined at Mineral Ridge, Trumbull County, Ohio, and in and about Canal Dover, Tuscarawas County, Ohio, considerable quantities of black-band ore, which in appearance and in analysis corresponds very closely with the black-band ore mined and used in Scotland. The Mineral Ridge black band is richer in metallic iron and considered better than the Tuscarawas. The iron is soft and fluid, free from shrinkage and generally stronger than the imported Scotch. This iron, as you doubtless know, is used as a mixture with other irons which are stronger, but more hard and sluggish. There is still some prejudice in favor of the imported Scotch iron, but the results of using American Scotch, when well made, have been so satisfactory that this prejudice is gradually wearing away, and I have no doubt that in a few years importations will cease. There are four concerns in the Mahoning Valley making so-called 'American Scotch' iron. We are running our largest furnace on this grade and are shipping to 21 different States

in the Union. The iron is used in the place of the imported Scotch with the most satisfactory results. Our neighbors are also shipping largely to distant points."

#### Notes of the New Orleans Exposition.

In these notes it is not the intention of the writer to attempt a general report of the "Industrial and Cotton Centennial," now in progress at New Orleans. A few general impressions, and brief mention of such events as naturally attracted our attention as possessing special interest for our readers, must suffice.

At the outset, we would say that the stories of lack of accommodation, extortion and general bad treatment of visitors, which have gained currency in the North, seem to be greatly exaggerated. So far as we have been able to discover, the accommodations are ample, the charges moderate and the facilities for transportation to and from the exposition, especially by the river route, as good as could be desired. Hotel and hack rates are high, but not more so than at other times. Comfortable rooms can be had cheaply enough, and there are plenty of restaurants, especially in the French quarter, where excellent meals may be had at prices to which no one need object. In a word, no one should be deterred from visiting New Orleans by the fear that he will be overcharged for accommodations. He can have whatever he wants at prices within his means. If the New Orleans exposition attracted the crowd which deluged Philadelphia during the Centennial, it would probably be different, but the attendance has thus far been so small that competition has kept prices relatively low.

The exposition buildings are curiously located, about 7 miles from the city, on what was formerly a plantation of great extent and value. It has since been used as a public park. The area inclosed for the exposition is about 100 acres, quite level and with some interesting trees and shrubbery. The principal buildings are judiciously disposed. The main building is the largest ever erected. It is built without partitions and has a continuous roof. It covers 33 acres of space. The machinery department occupies a space of 1378 feet long by 300 feet wide within the main building, and has an extension added in iron 540 feet long and 120 feet wide for heavy machinery, described under the heading of factories and mills. From the galleries more than 2 miles of shafting can be seen driving every known character of machinery. Music Hall, with a seating capacity, in commodious chairs, for 11,000 people, a platform capacity for 600 musicians and a mammoth organ built to order for the exposition, occupies the center of the interior.

The building for the United States and State exhibits is one of the largest exposition buildings ever erected. It was built specially to afford space for the United States Government exhibits, and for the collective State and Territorial exhibits. The exhibits of the Department of Women's Work, those showing the work and progress of the colored race and the educational exhibits are displayed in the galleries of this building. The Art Gallery is an artistic structure, so arranged for mounting, accessibility and light as to present the best effects, and with ample accommodation. It is erected wholly of iron, and is thoroughly fireproof.

The live-stock quarters consist of several buildings, each 378 x 72 feet. Their total area for live stock is 2080 x 780 feet, which includes the ½-mile track and arena.

Horticultural Hall is the largest conservatory in the world. It is substantially built as a durable structure, becoming, by arrangement with the city, a permanent feature of the park. It is located on high ground, in the midst of live-oak groves. Surmounting the center is a magnificent tower, 90 feet high, roofed with glass. The display of fruit is the best and largest ever made. Besides fruit, all the various kinds of tropical shrubbery and flowers, foliage and plants of the choicest varieties are shown.

The department of factories and mills is attached to and extends south from the southwestern portion of the main building, it being virtually an extension of Machinery Hall. It contains the various kinds of heavy machinery, cotton compresses, sugar and rice machinery, &c. Various kinds of factory and mill machinery for wood-working, brick and tile making, &c., are located in this structure. Adjacent to this building there will be a line of sawmills, extending toward the river, showing large numbers of sawmills in motion. The Grand Rapids (Mich.) furniture pavilion is erected by the Grand Rapids Furniture Association. Desiring more space than could be afforded them in the main building, they applied for permission and location to erect their own structure to contain their exhibits. The pavilion is very eligibly situated on the main thoroughfare, between the main and the Government buildings.

The Mexican National Exhibit, though small in comparison to various other exposition structures, is of most beautiful design, of the costliest workmanship, and is a striking and attractive feature. It is built of iron and glass, of a design similar to a Moorish kiosk. It is built by the Mexican Government, and will be taken down and removed to Mexico as soon as the exposition is over. It is not yet open to visitors. The Mexican National Headquarters is a beautiful structure erected by the Mexican Government in the southeast portion of the exposition grounds. It furnishes offices for the various Mexican officials, and quarters for the famous Mexican band, and for the different detachments of the Mexican army on duty at the exposition. This building will be removed to the City of Mexico after the exposition is over.

There are several other buildings of the exposition worthy of note and illustration. The Sawmill Row, a building several hundred feet in length, situated west of factories and mills; the Wagon Range, running north from the center of the main building; the United States Life Saving Service Building, on the island in Lake Rubio, &c. There are large numbers of minor structures and buildings, erected by private parties and corporations, scattered over the grounds.

Perhaps the most unsatisfactory feature of the exhibition is the apparently unsystem-

atic classification of exhibits. Articles which should be brought together are often separated widely, and one can never be sure that he has seen all the exhibits of a class unless he has searched every corner of every building. Another unpleasant feature is the absence of anything like an official and trustworthy catalogue. There are two catalogues, each claiming to be complete and accurate, but on comparing one with the other, and with the actual position of objects on the floors, it is found that neither is complete nor correct, and that the "method of error" is undiscoverable. The larger of the two consists of 84 pages, ordinary pamphlet size, printed in large type, which includes illustrations, long descriptions of all the buildings and a strangers' guide to the city. Less than 25 of the 84 pages are devoted to matter which can properly claim to be a part of the catalogue of exhibits. Comparing this with the Paris and Centennial catalogues, it becomes evident at a glance that the visitor had much better depend upon his own powers of observation than upon the so-called catalogues printed to aid him.

The first impression of the visitor on entering the main building is favorable. Its immense extent and the almost unlimited perspective of its aisles are impressive. As one becomes more familiar with its surroundings, however, he recognizes that it is not as satisfactory as he at first imagined. The immense area is but imperfectly filled, and the spaces allotted to exhibitors are often out of all proportion to the interest of their exhibits. Evidently the difficulty of the management has not been to satisfy exhibitors with less space than they wanted, but to make a limited amount of material appear to fill a great deal more space than it need occupy. Perhaps the waste of space is more evident than it would be if the attendance of visitors was comparable to that at the Centennial, but as the building presents almost a deserted appearance on the days of largest attendance, and as the great open aisles and passages seem almost empty, the openness of the arrangement is the more conspicuous. It would not be fair, however, to convey the impression by these comments that the main building lacks interest. Its 30 acres of floor area contains much to delight and instruct the visitor. But its vast distances fatigue him, and when he passes such exhibits as those of some of the agricultural implement makers, containing a display of plows set 10 feet apart each way, he cannot help wishing that the main building was only half as large and the exhibits twice as numerous to the acre. The exhibit of the Pullman Palace Car Company, for example, suggests the wish that the management had given the company all of the ground not otherwise occupied, and fenced off that section of the building for telescope trials.

#### WASHINGTON NEWS.

WASHINGTON, D. C., March 25, 1885.

(From Our Regular Correspondent.)

The correspondent of *The Iron Age*, in order to advise the industrial interests of the country of the probable policy of the Administration upon the question of the tariff, called upon the Secretary of the Treasury, Mr. Manning, to-day, and had a very satisfactory interview covering the preliminary features of the subject.

Secretary Manning fully appreciates the vital importance of this question to a large share of the population, capital and enterprise of the country, and particularly the injurious effects of uncertainty as to the future purposes of the executive and legislative branches of the Government. The correspondent of *The Iron Age* opening the subject, the Secretary of the Treasury replied: "I fully comprehend and appreciate the fact that there is a great and proper desire on the part of the people and their enormous and growing mechanical interests throughout the entire country to know something of the probable policy of the Administration on the tariff and cognate questions. You will agree with me that it is a little early as yet to advance any very specific views on the subject. The time of the President and members of the Cabinet has been too much taken up in getting the machinery of the Administration started, but generally, I may say this for the present, that when the tariff question is reached as a measure of administrative policy the President will carry out the tariff plank of the Democratic platform both in the spirit and letter. In this I believe he will be supported by the entire Cabinet."

Correspondent: "Several members of the Cabinet, Secretaries Bayard and Lamar, and Attorney-General Garland have been rather free in their views on the tariff."

The Secretary: "I cannot say as to that; they may have their views. All I can say is that whatever position the Administration may take it will be in the line of the Democratic platform, and I anticipate harmonious action in that direction."

Correspondent: "The President has thus far on other subjects adhered very closely to the principles of the platform upon which he was elected."

The Secretary: "He has, and the people will find as his plans develop that he takes a conscientious view of the obligations of his position as they are presented in the platform upon which he was elected. He is not disturbed by temporary clamor or antagonisms. Opposition must be expected. The President simply wishes to be convinced that he is right and then he will go ahead. On the tariff question, you may rely upon it, he will follow on the line of the platform upon which he was elected. In doing that I am confident that the people having the best interests of the country at heart will sustain him."

Correspondent: "In his letter of acceptance he refers to labor, but not to the tariff."

The Secretary: "True, but he mentions very specifically that he indorses the platform in every particular."

Correspondent: "The Democratic platform is somewhat comprehensive on the tariff, but is differently construed."

The Secretary: "You may take the tariff expressions of the platform as the groundwork of the policy of the Administration when the tariff question is reached for consideration."

Correspondent: "I presume it is probable that the tariff question will be opened."

The Secretary: "I think it will be." The Democratic party in its platform is pledged to a revision of the tariff. It adds, "in the spirit of fairness to all interests." The faith of the Nation must be preserved inviolate. Therefore, whatever is done on the tariff by way of revision should be done cautiously and by conservative methods. In reducing taxes we must not ignore the interests of domestic industries. The customs being the chief source of revenue they must be relied on for that purpose, and any radical measures might seriously cripple the financial condition of the Government."

Correspondent: "Some industries rely upon absolute protective legislation."

The Secretary: "That is true, and therefore, whatever changes should be made in the tariff laws, the interests of labor and capital alike must be considered."

Correspondent: "Great stress is laid on limiting taxation to the requirements of the Government economically administered."

The Secretary: "That is the doctrine of the platform, but then in an explanatory clause it says that the reduction must be made without depriving American labor of the ability to compete with foreign labor, and without imposing lower rates of duty than would be sufficient to cover the additional cost of production due to higher wages here."

Correspondent: "That would impose but few changes in existing statutes."

The Secretary: "I cannot say to what extent, as I have not yet examined the subject. Going back to the platform, it might be that duties would be levied on fewer imported articles, the heaviest being on articles of luxury, and lightest on articles of necessity, but this must be done with reference to our home industries, home interests, home labor and home capital. The tariff is a difficult subject to adjust when you undertake to reconcile all interests. It resolves itself into a simple question of the greatest good to the greatest number."

Correspondent: "I have heard a hint that the Administration might formulate a measure of its own and submit it in the report of the Secretary of the Treasury to Congress."

The Secretary: "I cannot say as to that. Circumstances will determine what course to pursue. The tariff is properly a measure of legislation, but the Secretary, no doubt, has the right to recommend. There is an instance in the history of the department where such a course was pursued. I believe it worked very well. The tariff question will be considered at the proper time, and the plan of procedure will then be arranged."

#### CUSTOMS CASES.

Assistant Secretary of the Treasury Fairchild proposes to adopt a new course in the consideration of customs cases. Under his predecessor, Mr. French, all questions of appeal from assessments of duties by the collectors were investigated by that gentleman himself, and were prepared for formal promulgation in the customs division of the office of the Secretary of the Treasury. Assistant Secretary Fairchild now intends to refer all legal questions involved to the solicitor of the Treasury, and after receiving the opinion of that officer he will review the decision. In order to reach this result all matters of a purely administrative character will be acted upon as heretofore in the customs division of the Secretary's office, and inquiries upon legal points involved will be formally submitted to the solicitor for his opinion, which will then form the basis of the opinion to be rendered. Assistant Secretary Fairchild's purpose is to keep political or personal influence out of the interpretation of the tariff statutes, and to get at their meaning without reference to the interests of protective or free-trade theories. This policy will rather heighten the interest of the new Assistant Secretary's decisions.

#### THE NEW COMMISSIONER OF PATENTS.

Mr. Martin V. Montgomery, of Michigan, the new Commissioner of Patents, having taken the oath of office, has left Mr. Dryden, the efficient Deputy Commissioner, in charge, and has started for his home to make arrangements for his removal to this city, where his official duties will require his presence. Like all other appointments thus far made by the President, Mr. Montgomery had no machine backing and brass-band demonstration, but was simply invited here, when the President announced to him the position which was at his disposal.

#### INTERSTATE COMMERCE.

The Vice-President has appointed as the committee authorized by the resolution of the Senate, adopted March 17, to investigate the question of interstate commerce: Senators Culham, of Illinois; Platt, of Connecticut; Miller, of California; Gorman, of Maryland, and Harris, of Tennessee.

#### COMMITTEE ON COAST DEFENSES.

A proposition is pending in the Senate to authorize the Committee on Coast Defenses to sit during the recess of Congress at such places in the United States as they may deem proper, to inquire into all matters connected with the subject of seacoast fortifications and other works of defense.

**An Ancient Tunnel.**—A tunnel measuring about 5000 feet in length and constructed at least nine centuries before the Christian era has just been discovered by the Governor of the Island of Samos. Herodotus mentions this tunnel, which served for providing the old seaport with drinking water. It is completely preserved, and contains water tubes of about 25 cm. in diameter, each one provided with a lateral aperture for cleansing purposes. The tunnel is not quite straight, but bent in the middle. This is hardly to be wondered at, as the ancient engineers hardly possessed measuring instruments of such precision as those constructed nowadays.

Osgood & Barker, manufacturers of paper-making machinery, are building a machine of special design for the Fall Mountain Paper Company, of Bellows Falls, Vt. The machine has 14-inch drying cylinders, 87-inch face, 42 inches in diameter, and is made from entirely new patterns throughout.



## THE WEEK.

An electrician in this city is completing the details of a machine for undercutting coal. It consists of a series of augers driven by an electric motor. A Philadelphia banker is at the head of the enterprise, and the machine is to be tried in the near future in a mine at Sharpshurg, Pa.

Australian copper smelters are beginning to recognize the claims to superiority of the American water-jacket furnace. At a recent special meeting in London of the Corporation of South Australian Copper Mines, the manager of the mines, Capt. W. T. Bryant, made a favorable report after having visited American works and having seen our type of furnaces at work.

The cold weather has developed serious defects in the design of the road-bed of the Philadelphia Traction Company's cable road. The freezing of the ground causes a very heavy pressure to be brought to bear upon the sides of the wrought-iron conduits, followed by jamming of the grip. Very extensive and costly changes will be necessary and have now begun.

A bill introduced into the New York Assembly legalizes the use of barbed wire in the construction of road and line fences.

Merchants in the Dominion are taking much interest in the exhibition of manufactures of all kinds to be opened in the Mexican capital in May next. The Government appropriated \$10,000 in aid of the general objects. In Montreal solicitude is expressed lest manufacturers "over the border" anticipate their movements and place Canadian products at a disadvantage.

It is said that paper flour barrels will soon be in general use.

The official organ of the International Association reports that the administration of the Congo will still be located in Brussels, and will be represented in Africa by a Viceroy or Governor-General. The Congo State will be divided into three or four provinces, each in charge of a Governor, who will be under the orders of Governor-General Stanley.

A salt vein 20 feet in thickness and of an excellent quality has been discovered near Clifton Springs, N. Y., and extensive works will be erected.

Thirteen States have bureaus of labor statistics and four others are in contemplation. That of Massachusetts is the oldest.

The Montreal Herald complains that the Dominion is too much trammelled by the commercial policy of England. "What we need," says the editor, "is not that free trade which would lay us helpless at the feet of English manufacturers, to the crushing out of our home industries, but the exercise of our right to negotiate commercial treaties and open up markets for ourselves wherever our commercial interests may carry us." In other words, Canadians wish they had a more open market for their meats, grain and lumber in the United States.

Sandwich Island papers represent that ruin will surely follow the indiscriminate importation of Chinese, Portuguese and South Sea Islanders, should the present system of providing labor for the sugar plantations be continued a few years longer. The Government pays a royalty for every immigrant landed.

The new steamer Dolphin, built for the United States Government, will not be accepted until all the details of her construction have been examined.

Two steamers of the Anchor and National lines have been seized in a suit to recover \$30,000 for damages caused by the collision of the Queen and Anchor, nearly five years ago.

Irving O'Donnell, formerly in the scrap-iron business in Pittsburgh, is about to erect a 30-stamp mill in an abandoned gold mine in Chihuahua. The machinery will come from Chicago.

Within the past six years the production of white-pine lumber in the Northwest has more than doubled. In 1878 it was 3,629,473 M feet, and in 1884 had risen to 7,935,033 M feet, the largest quantity ever produced in a year. But it is to be added that the production last year was very largely in excess of consumption. Lack of information as to the exact stocks on hand at the mills for previous years makes it difficult to say just how the consumption has varied, but the stock on hand at the close of 1884, according to the *Northwestern Lumberman*, was 3,516,957 M feet, or nearly as much as a full year's production six years ago. It is stated that last year's production of lumber and shingles weighed about 12,524,000 tons, which is a third more than the entire east-bound movement of the trunk lines.

The Hudson River ice crop this year will comprise about 4,000,000 tons of excellent quality.

New York City urgently needs a large public building of fire-proof construction to replace the old court house building and register's office which now disfigure the eastern side of City Hall Park. To enlarge the old City Hall as proposed by the Aldermen would destroy its architectural proportions, and the invaluable records now exposed to destruction by fire would still be insecure.

In a review of the growth of the Argentine Republic, the Buenos Ayres *Standard* states some facts significant of the great development of the country within the last 35 years. Briefly, it says that in that period the population has trebled, the influx of settlers grown thirty-five-fold, the amount of public wealth has multiplied 5 times; the

number of sheep, 11 times; the export of wool, 14 times; the emission of paper money, 10 times; public revenue, 8 times; commerce, 7 times; post-office traffic, 68 times; area under agriculture, 12 times, and value of house property, 5 times. Advances to February 12 speak of the recent financial crisis as passing away.

Commissioner Charles F. Peck, of the Bureau of Labor Statistics of the State of New York, sailed for Europe on the 18th inst., and, according to report, will gather all possible information in regard to the causes of industrial depression abroad, both in behalf of the Secretary of the Interior at Washington and for his report to the State of New York.

Two screw steamers were recently ordered in German shipyards for the Sultan of Zanzibar.

The magnificent harbor at Puget Sound, on the Pacific Coast, is described by an old shipmaster, who says a vessel drawing 15 fathoms could enter the straits without obstruction. In fact, 60 fathoms of water can be found all the way from the sea to the town of Tacoma, a distance of 162 miles. In this fair, open water-way there is no place where less than 17 fathoms can be found; there are no middle grounds to impede navigation. The shore line of Puget Sound is about 1700 miles, and in all this vast inland sea there are no shoals or reefs or other obstacles to running ships, should they draw 10 fathoms of water. These statements can be verified by a perusal of the United States Coast Survey. Puget Sound proper as a harbor is pre-eminent, and stands at the head of all harbors on the Continent of America.

The scheme for a Bureau of Labor Statistics in Connecticut has been defeated by a decided vote.

Bills about to be presented to the British Parliament provide for raising \$50,000,000 to complete railways in India.

Shoes made in Athol, Mass., for miners in California contain 862 Hungarian nails in each pair, and weigh 5½ pounds.

Despite the fact that the River and Harbor bill failed to pass, which last year amounted to over \$13,000,000, the appropriations for this year are more than \$20,000,000 in excess of those for last year, on account of the increase of pensions. Leaving out the appropriations for pensions and rivers and harbors the budget for 1886 is about \$157,000,000, against \$159,000,000 for 1885 and \$143,000,000 for 1884.

The breach between the Pacific Mail Steamship Company and the overland railroads was made complete on Friday by the action of the Central Pacific Railroad in joining with the Union Pacific in notice of the termination of the contract. As the contract requires only 30 days' notice, an active competition in California rates is liable to break out at any time.

Instruction to mechanical trades has been introduced in the Maine State Reform School at Cape Elizabeth, and has enlisted the interest of many of the boys, who have made very good progress under it. The boys are carefully taught first the names and uses of tools, and then how to use and keep them in order.

Philadelphia wharf owners announce that hereafter all vessels arriving at that port will be allowed to use the wharves free of charge when loading grain for shipment, which fact should be heeded in New York, especially by those who would embarrass the Erie Canal. By the way, the project to get a railroad in the bed of the canal was defeated in the Assembly by a vote of 66 to 6.

The stock of provisions in the West, March 1, according to the Cincinnati *Price Current*, shows 56,357 barrels of pork more than a year ago, 7338 tierces less of lard and 82,000,000 pounds increase in meats. The total stock of product is 453,000,000 pounds, compared with 361,000,000 pounds in 1884, 478,000,000 in 1883, 476,000,000 in 1882, 460,000,000 in 1881 and 562,000,000 in 1880. The largest winter packing was recorded six years ago, when the total was 7,480,000 hogs, or 1,015,000 hogs more than the past winter.

The paraffine works near Elizabethport, N. J., containing \$75,000 worth of new machinery, were burned 18th inst.; no insurance.

The Hon. Martin Van Buren Montgomery has been appointed Commissioner of Patents.

George W. Bell, a well known shipbuilder, member of the firm of Webb & Bell, died at his residence in Brooklyn, 20th inst. Prior to the decadence of our mercantile marine he was widely known as a naval designer and constructor. Several vessels of the Pacific Mail Steamship Company, as well as a number of men-of-war and many merchant ships, were built under his supervision. The caissons for the foundations of the Brooklyn Bridge piers were built by his firm, and the task of launching those immense and unusual structures, upon which engineers and shipbuilders looked with concern, was successfully performed by him.

The Senate on Friday ratified the additional article of the Mexican treaty extending until May 20, 1886, the time for the approval of the laws necessary to carry into operation the commercial convention between the two Governments concluded at Washington, January 25, 1853, and removed the injunction of secrecy therefrom.

Statisticians show that the wheat trade of California, Oregon and Washington Territory with Europe give employment annually to more than 400 sailing vessels going round Cape Horn. The average passage for each vessel is about 16,000 miles, in an average time of a little over four months.

The United Magdalena Steam Navigation Company, of New York, have called the at-

tention of the Secretary of State to the seizure of their steamers in the United States of Colombia by an armed force.

It is reported in shipping circles that the American Shipbuilding Company, of Philadelphia, are to be reorganized under the management of Capt. J. M. Lachlan, of the United States and Brazil Mail Steamship Company.

Successful experiments have been recently made at Cincinnati with the new electric railway brake. The trial was made with a heavy coal train of 10 cars, each car weighing, empty, about 11 tons, and having a tonnage capacity of 40,000 pounds. The loaded train, with full steam on, was put to a speed of 48 miles per hour on a down grade of 68 feet to the mile, and brought to a dead stop in 37½ seconds after putting on the brake, the distance run in that time being 445 yards, exact measurement.

The new rudder forged by John Roach & Son for the steamship Alaska weighs 12½ tons.

The Central Pacific Railroad Company are making arrangements to burn petroleum to make steam for the shops at Sacramento, Cal., instead of wood and coal. Ten large iron tanks have been placed on a huge framework of wood to get the necessary fall, so as to have the oil feed the fire by gravitation.

Warren Roosevelt will soon commence building a large dock at the foot of Forty-second street, South Brooklyn. It is estimated that the work will cost \$75,000 when completed next fall.

The first lace factory in Pennsylvania will soon be in operation at Wilkesbarre, with machinery imported from England.

There are now seven mills in Pittsylvania County, Va., engaged in the manufacture of sassafras oil. It takes 75 pounds of roots to make a gallon of oil, which sells for \$4.05 per gallon. It is used for flavoring soaps.

A bill introduced into the New York Legislature stipulates that contractors who remove street sweepings from New York City for deposit in the Atlantic Ocean shall employ only seaworthy vessels propelled by steam.

Senator Van Wick, of Nebraska, complains that the Government commission to Mexico and South America—comprising two men and a boy—the chairman remaining at home—expended "about \$40,000" before they reached New Orleans.

Congress passed an act at the late session making the scale of letter postage 2 cents per ounce, instead of 2 cents per ½ ounce, to take effect July 1.

A long and desultory discussion which took place in the New York State Legislature on Saturday developed the fact that Senators are not inclined to interfere with the present usages regarding contracts between individuals and corporations.

The proceedings of the recent meeting of the American Institute of Electrical Engineers, which have just been published, contain an interesting debate on the subject of underground wires. Mr. W. M. Callender, one of the ablest members of the Institute, read an important paper favoring the project of laying underground wires; and in the course of discussion, Mr. Prece, the eminent English electrician, remarked that the question of aerial wires and underground wires was not a problem to be solved; it was a problem that had been solved; and whether a wire be put under ground, or whether it be put above ground, was simply a question of pounds, shillings and pence.

The remains of the late Gordon W. Burnham were interred on Sunday in Greenwood Cemetery, after impressive services in Grace Church, which were attended by a large number of prominent citizens, also representatives from manufacturing establishments in Waterbury, Conn., and institutions in this city.

The total value of drugs imported into New York last year was \$52,000,000, which is an increase compared with the previous year. Three-fifths of the whole consist of free drugs and chemicals. No other trade stands up so well under the existing depression.

The loss by the burning of the Boston Machine Company's works, in South Boston, recently is placed at \$250,000. The insurance aggregates \$120,000.

The library and documents of the New Jersey Labor Bureau, with the manuscript of the greater portion of the annual report, were destroyed by a fire which partially consumed the State House at Trenton, on Saturday. Governor Abbott recommends that a new fire-proof public building be erected.

Capt. Bedford Pim, Royal Navy, calls the attention of M. de Lesseps to the fact that the promised opening of the first section of the Panama Canal in March inst. is far from being accomplished, and asks for information.

During the three winter months of December, January February there were more departures from New York than arrivals here in the steerages of the European steamers. This is the first time the balance was ever against us.

The sanitary authorities of this city speak favorably of stone street pavements laid in concrete.

It is said of Mr. Fairchild, the new Assistant-Secretary of the Treasury, that when he last visited Germany he made inquiry to discover the secret of Von Moltke's wonderful executive power. He found it to be in the fact that he was surrounded by a very able staff of young and brilliant men. Every

one of these men owed his position to merit, and not to any one's influence. It was generally understood in Germany that any officer in the service who distinguished himself by his work, no matter how remote his station, was certain to be summoned to join the staff of the commanding officer. It was this glorious possibility that kept the young men of that service on the alert and developed fine men. Mr. Fairchild thinks that some such spirit as that in the management of the public service would bring it up very soon to a high standard.

Thomas W. Fitch, son-in-law of General Sherman and ex-President of the Harrison Wire Works, is sued by that company to recover \$102,279, alleged to have been overdrawn.

An Anglo-Russian company has started to compete with Americans and Australians in furnishing England with meat. The abattoirs of this new concern are located in the center of Libau, and the company calculates to sell in England alone \$3,000,000 worth of meat every year.

The new steamer Philadelphia, Captain Hess, the latest addition to the Red D Line, plying between this port and Laguayra, Porto Cabello and Curacao, has taken her place in the line. She was built by William H. Cramp & Sons, of Philadelphia, at a cost of nearly \$400,000. She is 283 feet in length over all, 35 feet breadth of beam and 20 feet 6 inches depth of hold. She has five watertight compartments, each ventilated by an air shaft connecting with the funnel, has steam steering gear and all other of the latest improvements.

Since the Presidency of General Barrios, of Guatemala, New York has become the port for the sale of coffee and other products of the country, and for which the former market was England. American capital has built two railroads from the Pacific Coast to the City of Guatemala, and is now constructing a connecting road to Port Barrios, or Point Santo Thomas, in Livingston Bay, which will make a transcontinental railway through Central America. A bill now before the Legislature of this State, to authorize the acquiring, constructing and operating roads in foreign countries, is understood to refer to the two railroads above mentioned.

An improved demand for dwelling-house property in Brooklyn is attributed to lower tolls on the East River Bridge.

An Ottawa telegram says the Canadian Pacific Railway Company will immediately order the construction of ships for their contemplated line between British Columbia and China.

The Pennsylvania Steel Company have begun to make steel slabs for nail plate.

After making a number of changes, the Scranton Steel Company have succeeded in making the unparalleled record of blowing 71 heats with two converters in 12 hours. A few days before that they had reached 68 heats in spite of some delays. Their rolling capacity is now 50 tons an hour.

## LATEST LEGAL DECISIONS.

## LIBEL.

Z. sued H., the publisher of a newspaper, for libel in the publication of this advertisement: "Wanted—E. B. Zier, M. D., to pay a drug bill," in a part of the newspaper with the heading "Wanted," and among other similarly suggestive items, of which the following is a specimen: "Wanted, — to pay his room rent and not go deadheading his way," and to further publish it, as alleged, the defendant cut the item concerning the plaintiff out of the paper, pasted it on a postal-card and sent it through the post office to a young lady in Minneapolis to whom plaintiff was engaged to be married. It was alleged that defendant meant by the publication that the plaintiff was an absconding debtor and a dishonest person, not entitled to the confidence and respect of the community. It appeared on the trial that the postal-card was sent by the advertiser, a third person. Plaintiff got a judgment, and defendant carried the case—Zier vs. Hoplin—to the Supreme Court of Minnesota, where he was again beaten. The Chief Justice (Gilfillan), in the opinion, said: "1. We do not think that the words in themselves are defamatory on their face, for the words standing alone would suggest that the plaintiff owes a drug bill, and that the creditor wishes him to pay it, and nothing wrong is, necessarily, imputed to him. But words which may be innocent in themselves may be rendered libelous by the place and circumstances of their publication, for such place and circumstances may impress upon them a meaning and suggestion which, standing alone, they do not have. Thus, though the words here do not of themselves impute wrong, they might be published in such a place or under such circumstances as to make them capable of naturally conveying the impression that plaintiff had been guilty of dishonest practice, either in contracting the debt or withholding payment of it. And so they come under the head of words reasonably susceptible of a defamatory as well as of an innocent meaning. What meaning they would naturally convey was for the jury to determine, in view of the circumstances of their publication. 2. The postal-card was not sent by the defendant, but the sending of it upon a postal-card to the young lady was only a further publication of it—an extending of the publication made by the defendant. Now, although one who publishes a libel is not to be held responsible for an independent wrong done by a third person, though connected with the libel, he is responsible for the natural consequences of his own wrongful act, although the wrongful act of a third person may concur in bringing about such consequences. If it were a natural consequence of defendant's publication through the newspaper that some evil-disposed person should send a copy of the paper, or the item cut from the paper, to some one whom defendant had not thought of its reaching, he would be liable for it as

the consequence of his own wrong. It was for the jury to say whether sending the postal-card by a third person was a natural consequence of defendant's publication in the newspaper."

An action of libel was brought against a commercial agency on the following report. In speaking of an elevator company it was said, "Their elevator has been condemned as unsafe, and the Chamber of Commerce decline to accept or do business with their wheat checks. The facts of the case seem to be that Locke has misled the other investors, and put up a building which is unsafe for business, and stands idle. The investors seem to regard themselves as having been victimized. The company are not considered as having a basis of any credit." In this case—Locke vs. the Bradstreet Company—brought in the United States Circuit Court for the District of Minnesota, in charging the jury, Judge Nelson said: "It is my duty to instruct you that every willful and unauthorized publication, written or printed, which imputes to a merchant or other business man conduct which is injurious to his character or standing as a business man or merchant is a libel and implies malice, but whenever the author or publisher acts in the bona fide discharge of a public or private duty, legal or moral, or in the prosecution of his own rights or interests, that which is communicated in writing under such circumstances is a privileged communication, unless it is actuated by malice. If it is a privileged communication, then, although the statements are defamatory, actual malice must be proved to entitle the aggrieved party to recover damages. A communication is privileged within the rule when made in good faith in answer to one having an interest in the information sought, and it will be privileged when volunteered if the party by whom it is made stands in such relation to him as to make it a reasonable duty, or at least proper, that he should give the information. Applying the rule here, it is in proof that the defendant communicated the alleged libelous matter to its subscribers in Minneapolis and Duluth who had an interest in knowing it, and the communication is also volunteered to other persons who stood in such relations to the defendant as to make it a reasonable duty or proper that such information should be given, so that the conduct of the defendant consists of answers in writing to inquiries made, or volunteer information given to those who had an interest in it, and there was just occasion for imparting it to them. Therefore, I instruct you that the information given was a privileged communication. You must determine whether this privileged communication was defamatory and actuated by malice. In a case like this the falsehood of the statement and the absence of probable cause will amount to a proof of malice, and if you find that the statement was made without exercising ordinary care and caution in collecting the information, and without reason to believe in its truth, you will find for the plaintiff; but if you find that plaintiff has not rebutted the presumption which attaches to the statement as a privileged communication, then the defendant is entitled to a verdict." The jury gave the defendant a verdict.

## TRADE-MARK—RESEMBLANCE—EFFECT OF REGISTRATION.

A manufacturing company prepared corn meal for food, for foreign markets, and for many years had put up the meal in packages and designated the product "Maizena," and also put on the packages an allegorical picture showing the cultivation of corn, and the preparation and cooking of the meal by the Indians. Both the term and the picture were duly registered in the Patent Office on December 6, 1881, under the provisions of the act of Congress of March 3, 1881. The corporation or its predecessor in business was the originator of these trade-marks, had used them for many years, and had a common-law title to them before the defendant undertook to use in his foreign trade the word or picture registered by him, on December 5, 1882, which was the term "Maizena," and a picture of a man carrying a quantity of maize in his arms. The packages of the defendant were quite similar in form, color, size, printing and other respects. A suit was brought for an injunction and damages on the infringement of the trade-mark, and a motion for a preliminary injunction because the violation of the right was apparent. The defendant claimed that there was not a sufficient resemblance. In this case, Glen Cove Mfg. Co., brought in the United States Circuit Court for the Southern District of New York, the motion was granted. Judge Wallace, in the opinion, said: "1. As used by the defendant it seems clear that his devices were simulated to appear to be those of the complainant, and if the case turned on the principles which obtain, ordinarily, in equity when the use of a common-law right of property in a trade-mark is the subject of controversy, it would be the duty of the court to order an injunction, for there is enough deceit shown upon the public to call for that. But in this suit we must be controlled by the statute. The defendant has artfully garbled and draped a word used by him bearing a close resemblance to the complainant's word, so that its identity is rendered more indistinguishable from that of the complainant's than it is intrinsically. If the granting of the injunction depended upon the similarity of the word of the words we should be justified in giving it under the standing decision. Thus: 'Cocaine' may be held to infringe 'Cocaine'; 'Bovine' 'Bovine'; 'Apollinis' 'Apollinaris'; 'Hortetter' 'Hortetter'." 2. The defendant claims that the granting of the trade-mark by the Patent Office is a judicial determination and conclusion between the parties. But it is a sufficient answer to this proposition that the act of Congress makes the registration of a trade-mark only apparent evidence of ownership. Neither the complainant nor the defendant could maintain its trade-mark against one having a common-law title, nor as against each other."

On Monday morning, April 6, about 1800 men will be given work, and entire operations in all departments of the South Chicago mills of the North Chicago Rolling Mill Company will be resumed.











## Special Notices.

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which were successfully introduced the past year, have been improved for 1885, by using extra heavy interleaving paper, with red ink down rulings, and by adding \$4 extra unbound printed and illustrated pages pertaining to miscellaneous lines on which stocks vary, of which each house can insert such as interest them. The 220 pages, bound in the regular books, show mainly the lines on which all leading American hardware stocks agree, carefully selected in the interest of the merchant, from 211 different manufacturers, with 1574 illustrations, many of them full size. Books sent at once, charges prepaid, on receipt of the following:

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Old No. 2, with lighter interleaving and without down ruling. A few copies are in stock, which will be closed out, including the \$4 extra pages, at Price \$5 per copy.

Special Prices given to houses ordering six or more copies at one time.  
In ordering, state if you prefer Tin, Wooden and Hollow Ware left on. If not so stated, complete books will be sent, including these lines. These Price Books are indispensable to hardware buyers, travelers and clerks, saving often \$100 to \$200 in time, and giving better satisfaction than those made in the ordinary way. Address orders to

T. W. ROOT, Detroit, Mich.

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MACHINERY.

- 1 Corliss Beam Condensing Engine, 30-in. cylinder, 72 in. stroke.
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- 1 Horizontal Corliss Engine, 10-in. cylinder, 22-in. stroke.
- 1 Locomotive Boiler, 100 H.P.
- 6 Horizontal Tubular Boilers, 5 ft. diameter, 22 ft. long.
- 1 Horizontal Tubular Boiler, 4½ ft. diameter, 13 ft. 6 in. long.
- 1 Locomotive Boiler, 36 in. diameter, 12 feet long.
- 1 Upright Boiler, 4 ft. diameter, 1½ ft. high, 33 3-in. tubes.
- 1 7-horse Engine and Boiler combined.
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- 1 Knowlton & Kelly Steam Pump.
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- 1 Knowles Special Steam Pump, No. 7.
- 1 No. 38 Sturtevant Exhaust Fan.
- 1 60 in. Sturtevant Blower.
- 1 50 lb. Styles & Parker Drop Press.
- 2 Horizontal Tubular Boilers, 4 ft. diameter, 12 ft. long, 30 3¼ in. tubes.
- 1 Daniel's Planing Machine, 36 in. wide, bed 20 ft. long.
- A large lot of good second-hand Belting, Shafting, Pulleys and Hangers.

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Cuts and threads pipe ¼ to 3 inches, inclusive, right-hand threads, and ¾ to 3 inches, inclusive, left hand. Has Patent Adjustable Dies and Patent Gripper, by which pipe can be put in and taken out without stopping the machine. Has been in use one year.

Address  
FIELDHOUSE, DUTCHER & BELDEN,  
Manufacturers of Pipe and Fittings,  
30 W. Monroe St., Chicago.

## For Sale.

A Hardware Firm doing a good trade in one of the best cities in New York State is desirous of disposing of stock and business to reliable parties.

Address "X. L. T."

Office of The Iron Age, 83 Reade St., New York.

## Any One

who will send me the name or give me such information as will lead to the sale of a Boiler Engine or mill, will receive a regular commission.

H. M. SCIPLE,  
107 to 109 N. Third St., Philadelphia.

## Wanted.

A practical man, with capital, to take general charge of a Car Manufacturing Company in active operation. Address D. T. PARKER,  
Anniston, Alabama.

## Trade Report.

British Iron and Metal  
Markets.

[Special Cable Dispatch to The Iron Age.]  
LONDON, WEDNESDAY, March 25, 1885.

Scotch Pig.—The market is unchanged. We quote makers' brands as follows:

Coltness, alongside, Glasgow	54/6
Langloan, " "	54/6
Gartsherrie, " "	51/6
Summerlee, " "	51/6
Carnbroe, " "	48/6
Glenzarnock, " Ardrossan	48/6
Eglington, " "	48/6
Dalmellington, " "	46/6
Shotts, " at Leith	46/6

Lichterage from Ardrossan to Glasgow is 1/8 ton.

Cleveland Pig.—The market is unchanged. We continue quotations, f.o.b. shipping ports:

Middlesboro, No. 1 Foundry	38/6
" No. 2	36/6
" No. 3	34/6
" No. 4 Forge	33/6

Bessemer Pig.—Is a little steadier. W. C. Hematites are quoted 44/6 @ 44/6 for mixed lots, Nos. 1, 2 and 3, equal portions, f.o.b. shipping ports.

Manufactured Iron.—The market is unchanged. We quote at works:

Staff, Ord. Marked Bars	£ s. d.
" Medium	7 10 0 @ 6 10 0
" Common	5 10 0 @ 5 15 0

Hoops, 20 W. G. and over.

" Common Best	6 15 0 @
" Medium	6 5 0 @ 6 10 0
" Common	6 0 0 @ 6 7 6

Sheets, 20 W. G. and under.

" Ordinary Best	7 15 0 @ 8 5 0
" Common	7 5 0 @ 7 15 0
Welsh Bars	4 17 6 @ 5 2 6

Steel Rails.—Are unchanged. We quote £4. 15/ f.o.b. shipping ports.

Old Rails.—There is a brisk inquiry and prices are firmer and tending upward. We hear of inquiries from the United States for Old D. H's for delivery during the year. We quote Old D. H's, c.i.f. New York, £3 @ £3. 5/.

Scrap.—The market is active, with moderate offerings and steady prices. Inquiries to hand from the United States for Scrap for delivery during next three months. We quote Heavy Wrought £2. 10/ @ £2. 12/6, c.i.f. New York.

Copper.—The market is not so steady. We quote Best Selected, £50 @ £51, and Chili Bars, £45. @ £45. 10/.

Tin.—Is a little weaker. Straits Ingots, spot, £77. 10/ @ £78, and futures, £78 @ £78. 15/.

Tin Plates.—Are a little steadier. We quote:

Tin Plates, 10x14, 1st qual. Charcoal	19/6 @ 21/6
" " 2d " "	18/6 @ 19/6
" " 1st " Coke	17/6 @ 18/6
" " 2d " "	16/6 @ 17/6

Spelter.—The market is unchanged. We quote Ordinary, at shipping ports, £13. 17/6 @ £14.

Lead.—The market is unchanged. We quote Common English Pig, £10. 12/6 @ £10. 17/6.

Freights.—Steam from Glasgow to New York, 2/6.

## Financial.

Office of The Iron Age,  
WEDNESDAY EVENING, March 25, 1885.

If winter "lingers in the lap of spring," so does business. There is nowhere apparent that snap and vivacity which some had ventured to hope for, but the extraordinarily low temperature for March, shown by the record to be the lowest in 50 years, helps to explain the discrepancy. In some departments, as in the dry-goods jobbing trade, a fair amount of business has been completed, though not equal to that of the previous week, and reports from the interior and Western markets are, on the whole, of a cheerful tenor. The subsidence of the war scare left the grain markets in a rut, and exports have materially lessened. Other markets in some respects have felt a partial relapse. A large interior movement of corn is in progress, exciting apprehensions in the minds of some that the visible supply may assume undue proportions, but there is evidence that the consumption is very large, equal to two-thirds of the crop within six months past, farmers having turned their attention to growing pork. Provisions are lower, without stimulating either the export or domestic demand. Cotton has fluctuated with the changing import of war rumors. Orders on English account within the last week or 10 days comprise large quantities of oats and some 5,000,000 cans of meat. In regard to alleged orders for cartridges, manufacturers are reticent. It is not believed that the protective duties imposed upon wheat by France and Germany will materially affect the demand for American grain, all countries alike being under the ban, but the pork duty is in a measure prohibitive. Prices all around, as concerns speculative commodities, are about the lowest of the week. About the pork crop, seven large cities show a total of 4,621,054 hogs packed during the winter—average weight, gross, 265.47 pounds—compared with 3,867,485 hogs packed last year, weight 250.68 pounds.

The Stock Exchange market has been irregular during the past week and is gen-

erally lower. For the first three days the bears had full sway. Pacific Mail dropped about 15% in consequence of notice given that the Pacific railroads would no longer pay the monthly subsidy of \$95,000. The latter dropped 1 @ 2 points in sympathy.

Lake Shore advanced on the statement that a loan had been taken by a syndicate of bankers at 127. On Monday Pacific Mail was again a prominent feature, advancing sharply under reports that the transcontinental difficulties had been adjusted on the old basis. On Tuesday there was reaction under free sales and conflicting rumors.

Union Pacific dropped under an unfavorable decision by the Secretary of the Interior respecting the amount of its indebtedness. Jersey Central declined, under a belief that the company will be obliged to issue receivers' certificates to meet April payments, other coal shares declining in sympathy. The Vanderbills were influenced by an extension of the east-bound pool to May 1. To-day the market was strong under warlike advices from Europe and news that consols had dropped to 97. It was also said that the Grand Trunk refused to attend the Trunk-Line pool meeting in Chicago on April 1, and has made large contracts at cut rates.

Quotations were as follows: Lake Shore, 63¼; New York Central, 91; Northwestern, 94; Northern Pacific preferred, 40¾; St. Paul, 70½; Western Union, 57¼; Delaware and Hudson, 76¾; Manhattan, 77½; Missouri Pacific, 90½; Jersey Central was exceptionally weak upon a report from Philadelphia that a receiver had been appointed, and declined to 31; Lackawanna, 103¾; Union Pacific, 43½; Pacific Mail, 50½.

United States bonds closed as follows:

	Bid.	Asked
U. S. 3 per cents	101¼	101½
U. S. 4½, 1891, coupon	111½	112¼
U. S. 4½, 1897, coupon	122¼	123¼
U. S. 5, Currency 96, 1890	125	126
U. S. 5, Currency 96, 1890	127	128
U. S. 5, Currency 96, 1890	129	130
U. S. 5, Currency 96, 1890	131	132
U. S. 5, Currency 96, 1890	133	134

A Chicago dispatch says orders are just received for 5,400,000 lb. of canned meats, in addition to previous orders from the British Government.

The number of business failures reported in the United States during the past week was 247, as compared with 250 in the preceding week, and with 192, 196 and 118, respectively, in the corresponding weeks of 1884, 1883 and 1882. Canada had 37, an increase of 1.

The number of mercantile failures in the United States during the quarter to end March 31, as reported to Bradstreet's, will be much larger than the total during a like portion of any preceding year since such statistics have been collected. The largest number reported in any preceding first quarter was 3320, in 1884. From January 1, 1885, to March 14 the total failures throughout the country, with comparisons, were:

	Jan. 1 to March 14, 1885.	1884.	1883.	1882.
No. failures in the U. S.	3349	2787	2901	1797

For the period of 73 days covered, just one-fifth of the year, the aggregate in 1885 is 29 in excess of the total for the whole of the first quarter of 1884, the year in which the grand total of failures was 11,620, the heaviest on record. Remarkable upon the significance of the quarter's failures, Bradstreet's says: "The number of heavy failures has, comparatively speaking, shown a conspicuous decline. The forces which lie behind and which have been working out the destruction of so many commercial ventures appear to have proceeded far on their way from the center to the surface, and the records of failures show it in an increasing number of minor, often petty, commercial disasters. This appears to indicate the probable approach of a decline in the late heavy failure rate. Whether the day of the decline lies within three, six or nine months, it is, of course, at this time impossible to determine."

\* \* \* The weekly failure records during the next 60 or 90 days are likely to prove of exceptional interest and value as gauges of the probable proximity or the relative remoteness of more healthful influences in business circles, such conditions as are essential before a sound or permanent revival of trade can become possible."

The imports of foreign merchandise at this port during the past week were \$913,162 below those of the previous week, the total being \$7,743,652, of which \$5,408,049 represents general merchandise and \$2,335,603 dry goods. Since January 1 they aggregate \$87,929,959, compared with \$106,824,132 for the corresponding period of 1884. The total imports of dry goods since January 1, 1885, have been \$25,743,407, against \$34,231,058 for the same time in 1884, or a decrease of \$8,487,651. The exports of domestic produce from this port during the past week were quite moderate, the total being \$5,907,268, against \$5,202,396 for the same week last year. Since January 1 they aggregate \$78,600,129, compared with \$70,200,934 for the corresponding period of 1884.

According to the custom-house reports, the imports of specie for the last week were \$396,231, as against \$32,155 for the same time last year, making \$4,661,598 since January 1, compared with \$1,205,992 for the same time last year. The exports of specie for the week were \$462,238, making a total since January 1 of \$6,000,000, of which nearly one-half was in silver.

Returns from the leading Clearing Houses of the United States for the past week are unfavorable, showing a loss as compared with 1884 of 23.1%. The loss when compared with the previous week was inconceivable. Outside of New York City, which

has advanced its decrease of 16.6% to 12.1%, the decrease as compared with last year amounts to only 11.1%, against 8.6% the previous week. Railroad strikes and snow blockades have retarded the expected spring opening.

Secretary Manning has reached no conclusion respecting another bond call. Although the apparent Treasury reserve has reached \$151,000,000, there is some question as to precisely what funds should be classed among the available assets.

The official statement of the foreign commerce of the United States for February shows that the exports amounted to \$58,101,915, an excess of \$13,187,499, compared with the imports. For the last eight months the excess over imports is \$159,601,414, and for the corresponding period in 1884 it is \$88,275,000.

The weekly bank statement is without significance except as it affords evidences of continued stagnation in business. There was once more an increase in the surplus reserve, which now stands at \$47,923,350, against \$8,580,125 at the same time last year, and there was a decrease of nearly \$2,500,000 in loans. The posted rates for bankers' sterling were advanced to \$4.85 for 60 days' and \$4.87½ for sight. The market is dull.

The Bank of England rate of discount was reduced from 4% to 3½%, apparently because of the strong condition of the bank and the more favorable outlook of foreign affairs. For this market the rates for money are unchanged. At St. Louis, as at Chicago and other Western points, money is inactive.

Articles were filed for the incorporation of the King's County Bank, with a capital of \$150,000. Charles Holmes, of Cobleskill, N. Y., was appointed receiver for the Schoharie National Bank, which suspended on the 20th inst. In the United States Circuit Court, at Trenton, N. J., Judge Nixon filed an order that the receivers of the New York, West Shore and Buffalo Railway may issue certificates or notes, at not less than par, to the amount of \$3,300,000, which shall be a lien prior to the first mortgage.

A break in the freight arrangements between the transcontinental lines and with the Pacific Mail causes general demoralization on the routes affected.

## Metal Market.

Copper.—The long and severe winter has had the effect of intensifying the dullness in the general Metal market, and in Copper in particular, in which very little has transpired during the week. The Copper market has been weak and is lower. We quote Lake Superior 11¢, and other brands 10½¢ @ 10¾¢. Chili Bars in the London market have also declined, almost from day to day: thus, on March 19 they stood £45. 15/; March 20, £45. 7/6; March 21, £45. 10/; March 22, £45. 7/6; March 24, £45. 5/; and to-day the latter figure. Meanwhile Best Selected also gave way from £51 to £50. 10/. Manufacturers may be nominally quoted: Bottoms, 18¢; Braziers, 17¼¢; Sheathing, 16¢, and Bolt Copper, 18¢. We are cabled from London this afternoon that the market is not so steady. Quoted 10/ less for Best Selected and £1 for Chili Bars.

Tin.—Spot Tin not being abundant on this coast, the market for the same has been well upheld, in spite of lower figures in London, and we quote spot, Straits, 17¼¢ @ 17½¢, large lines. London came £77. 12/6, Straits, spot, yesterday, and £77. 15/ this morning, while three months' were steady on both days at £78. 10/. No new features have arisen, and the market on the whole is tame in consonance with the generally dull aspect. We receive from London the following per cable this afternoon: "Tin is a little weaker. Straits Ingot, spot, £77. 10/ @ £78, and futures, £78 @ £78. 15/." Tin Plates.—Like in everything else, developments in the Tin-Plate market have so far been a disappointment to all interested, the demand manifesting itself more slowly than is usually the case at this time of the year, but this may change with the advent of mild weather, the general position of the article being favorable and sound. Stocks in dealers' and consumers' hands are light, and Tin Plates are lower at present than they have been at any previous time in this market. We quote at the close, ordinary brands, large lines, 7½ box: Charcoal Bright, \$4.90 @ \$5.25; do. Ternes, \$4.45 @ \$4.60; Coke Tin, \$4.40 @ \$4.45; do. Ternes, \$4.30. Liverpool has been steady; the quotation there to-day is 15/6 @ 17/ for Charcoal, and 13/9 @ 14/ for Coke Tin. From London we are informed that the market is a little steadier.

Lead.—In a small way a couple of hundred tons Common Domestic sold at \$3.70, which remains nominally the closing figure, but the market lacks vitality, and may easily recede a trifle unless the demand revives soon. St. Louis has also shown less strength now that corrodors have laid in a sufficient supply to last them for some time. They quote Hard, \$3.45, and Soft, \$3.50. Soft Spanish was still £10. 10/ this morning.

Manufactures are quoted as follows: Lead Pipe, 5¼¢ @ 5½¢; Sheet Lead, 6¼¢; Tin-Lined Lead Pipe, 15¢, and Block-Tin Pipe, 10¢, allowing in trade for Old Lead delivered in New York, 3¢ @ 4¢. Shot; Drop, 6¢; Buck, 7¢; Chilled, 7¢. Shot in 5-lb bags, 1¢ @ 1½¢ extra. From London we learn this afternoon that the market is in the same condition.

Spelter and Zinc.—A sluggish state of affairs continues to prevail in Common Domestic Spelter, the little doing going at \$4.30 @ \$4.37½, while Silesian is nominally worth \$4.70 @ \$4.75. In London the latter has remained steady at £13. 7/6. We quote Bertha Refined unchanged, 8¢. Sheet Zinc has been steady. Domestic, 5½¢ @ 5¼¢. From London we are cabled this afternoon that the market is unchanged.

Antimony.—Has been dull at 10¼¢ for Cockson and 9¼¢ for Hallett. The latter does not vary from £39 in London.

## Chattanooga.

Office of The Iron Age, Carter and Ninth Sts.,  
CHATTANOOGA, March 23, 1885.

The weather for the past week has been very unfavorable for outdoor work, and has thrown farming back at least two or three weeks. A matter of much interest has recently been brought to the notice of Pig-Iron makers—the development of the Clapp-Griffiths process for the manufacture of Steel. This seems to give our iron men great encouragement, and already two or three of our largest plants are moving in the matter and getting up their plans for the purpose of erecting works, &c. The success of the system at other places would seem to guarantee its entire availability for this section, and, should it so turn out, it will create a revolution in the iron-making business of this district which can hardly be comprehended in its results. There is one question, however, to be considered which is fully expressed by the remark made by a gentleman of very large means and experience in the Iron business, who has come here with the view of investing. He said: "Should I invest one or two hundred thousand dollars in a plant of this kind, the probability is that some new invention would turn up in less than five years for the manufacture of iron by a still cheaper process that would render my plant valueless, and some fool or other would come along with some kind of a furnace that would make iron much cheaper than I could." Of course this is a consideration.

Pig Iron.—Sales have held up well for the past week, and several round lots have been placed in the West. There has been quite a lively demand from this quarter, and transactions are not a matter of as much negotiation as they were a few weeks ago. Notwithstanding what Eastern papers say, there are still considerable amounts sold in that market, and inquiries are more frequent than ever. Sales for the past week have been about 2000 tons for this market, 500 of which go to an interior point. Our Mill Irons are being largely contracted for in use pipe foundries and for making light castings—in fact, there are some foundries we could name that are using this grade exclusively. Stocks as a general thing are light, with no accumulation in the yards.

Hardware.—There is the usual demand for this class of goods. Barbed Wire is meeting with unusual sales at 5¢ @ 5¼¢ for retail lots.

Bar Iron.—The mills are supplying the demand for Bar Iron at 1.7¢ @ 1.75¢ for carload lots.

Railroad Fastenings.—All the mills have what they can conveniently do on Splices, which are quoted at \$1.70 for usual sizes. We quote Standard Spikes at \$2.85 for carload lots; Bolts at \$2.30 for keg lots.

Coal and Coke.—Much more care is being taken in the manufacture of this article; stocks are more carefully selected, with a view of getting it freer from dirt, and there are also more pains taken in the burning. Prices continue to rule at \$2.50 @ \$3 at the furnaces.

Ore.—There is nothing new to note in this article, while a few additional openings have been made. Prices continue to rule at a small advance above cost of mining and allowance of a small royalty to the owner of the mine.

Purification of Water by Oxygen.—Among the different applications of oxygen obtained by MM. Brin, of Passy, by their anhydrous oxide of barium process, is its use for rendering drinking water pure, a thing very necessary if Parisians are to drink water at all. They take filtered water and mix with it oxygen gas. A cylinder capable of supplying a pressure of 300 pounds to the square inch is used. Under this pressure a certain quantity of oxygen is dissolved in the water; the water is then put into bottles or syphons. The oxygen destroys all organic matter, and the result is an absolutely pure water, very light and tonic, and the faculty prescribe it for many diseases of the digestive and urinary organs.

In MM. Brin's works are two large reverberatory furnaces, filled with retorts 2 m. 80 c. long and 16 c. in diameter, which are in constant use. These contain the oxide of barium, which absorbs the oxygen at one temperature and gives it up at a higher.

The atmospheric air is first drawn through a vessel containing quicklime, which absorbs all the carbonic acid and moisture. It is then drawn into the retorts, heated at 500°; the barium absorbs the oxygen, and the nitrogen is drawn off to a gas-holder to be converted into ammonia, &c. When the barium has absorbed all the oxygen it can take up, the supply of air is closed.

The retorts are then heated to 800° C. and a communication opened to a vacuum chamber; the barium then exhales the pure oxygen, which is pumped into a gas-holder.

The Jones & Lamson Machine Company, Windsor, Vt., will send one of their new screw machines to the Inventions Exhibition, which is to open in London in May.



# Trade Report.

## New York Iron Market.

**American Pig.**—There are no special features to record. A fair quantity of iron in the aggregate is being sold in small lots, Southern makers taking a share of the business. In some quarters a tendency toward pressure to sell Gray Forge is reported, but does not appear to be general. One of the leading Lehigh furnace companies has been during the past few weeks delivering more Pig Iron than has been made at its furnaces. The circulars of the Northern Ore companies, now about a month later than last year, will be issued in a few days, and will, it is reported, show a reduction of about 25¢ per ton. At least one of the furnace companies on the Hudson River has already made its contracts for Anthracite Coal, securing a substantial reduction as compared with last year. The majority of the furnaces are, however, awaiting developments. We continue to quote standard brands of Lehigh and North River Irons, tidewater delivery, as follows: No. 1 X Foundry, \$18 @ \$19; No. 2 X Foundry, \$17 @ \$18; Gray Forge, \$16 @ \$17. The outside figure is asked for special brands. Outside brands sell for 50¢ @ \$1 less than our quotations.

**Scotch Pig.**—The market is very quiet, and transactions are on a moderate scale. It is a fact worthy of being noted that in some instances founders using exclusively some grades of Southern Pig have found it necessary to resort to more Scotch to make their mixture satisfactory. Nominal quotations for 5 and 10 ton lots are as follows: Colness, \$21.50 to arrive; Gartsherrie, \$21 to arrive; Shotts, \$21.50 to arrive, \$22 from yard; Langloan, \$21.50 to arrive, \$22 from yard; Carnbroe and Glengarnock, \$19 @ \$19.50 to arrive, and \$20.50 from yard; Summerlee, \$20.50 to arrive; Dalmellington, \$19 @ \$19.25 to arrive; Eglington, \$18 @ \$18.50 to arrive; Clyde, \$19 to arrive. For larger lots we quote, nominally, Colness, \$21.

**Bessemer Pig and Spiegeleisen.**—Foreign Bessemer has been exceedingly dull, while Domestic, in which no transactions of magnitude are reported, remains \$16 @ \$18, delivered at mill, according to quality. In Spiegeleisen buyers' and sellers' views are too far apart to admit of transactions. We continue to quote, nominally, \$25.50 for 20%.

**Bar Iron.**—Makers of the best brands report increased inquiry and in the aggregate quite a fair business in small orders—better, in fact, than it has been for months. Common Bar Iron, which is principally called for by the building trade, is still suffering from the dullness growing out of the unfavorable weather of the greater part of the last week. The following range represents quotations: Common Iron at mill, 1.4¢ @ 1.6¢; from store, 1.6¢ @ 1.9¢; Best Refined at mill, 1.65¢ @ 1.9¢; from store, 1.85¢ @ 2¢.

**Structural and Shaped Iron.**—With the exception of the rumored sale of 300 tons of Belgian Beams, nothing of any importance has been done during the week. Messrs. B. & J. M. Cornell, of this city, the largest buyers of Beams in this market, advertise that they are prepared to sell to consumers American Beams below the figure quoted by the association. They report that they have had a large number of inquiries during the past week. Angles continue low in large lots. Quotations for small lots continue to be, nominally, as follows: Angles, from store, 2.2¢ @ 2.6¢; Tees, from store, 2.8¢ @ 3¢. Beams and Channels are 3¢ on dock for all orders. Foreign Beams are quoted 2¢ for Belgian, and 2.8¢ for German.

**Plates.**—In Tin Plates business is dull, while on the other hand a number of good orders have been taken for Steel Plates of recognized quality. Usual prices of Iron Plates are as follows: Common or Tank, 2.1¢ @ 2.15¢; Refined, 2.15¢ @ 2.2¢; Shell, 2.15¢ @ 2.3¢; Flange, 3.15¢; Extra Flange, 4¢ @ 4.15¢; For small lots of Steel Plates the quotations are as follows: Ship, 2.3¢ @ 3¢ at mill; Tank, 3¢ @ 3.15¢ on dock; Boiler, 3.15¢ @ 3.3¢ for Shell, 4¢ @ 4.15¢ for Flange, and 4.15¢ @ 5.15¢ for Extra Flange and Fire Box.

**Sheet Iron.**—Business has been very quiet. We quote prices of Sheet Iron in our list of New York Wholesale Metal Prices.

**Merchant Steel.**—There has been no change. Nominal quotations are as follows: American Tool Steel, 7.15¢ @ 10¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; Crucible Machinery, 4.5¢ @ 6¢; Spring and Tire, 2.3¢ @ 3.15¢; Open-Hearth Machinery, 3¢ @ 3.15¢, and Bessemer Machinery, 2.3¢ @ 3¢; English Tool, 13.15¢ @ 15.15¢.

**Steel Rails.**—With current low prices the Steel mills show little disposition to take any risks, and, consequently, a large number of inquiries, saddled with unsatisfactory terms for payment, are not entertained. Some of the mills are pretty well supplied with orders for the next three or four months, and name nominal figures. Others seem to be still eager for business, and good buyers find no difficulty in placing orders for summer or fall delivery at low figures. We quote nominally \$26 @ \$26.50 at mill. Light sections are in demand in small lots. We quote for 30-lb, \$31 @ \$31.50 at mill.

**Steel Wire Rods.**—We note a sale of 4000 tons at private terms. The spot stock, which some report heavy, is partly material thrown upon importers' hands by the failure

of Wire mills. We quote \$41 @ \$42. Wire Billets are worth \$32.50 @ \$35 at mill.

**Old Rails.**—There have been a few sales of small lots, but generally buyers are not inclined to bid more than \$17, while sellers generally ask \$17.50. We quote that range nominally. Quite a large quantity of Old Rails is expected to reach the market during the next few months, and 15,000 tons known to be ready for shipment in Texas are expected to come chiefly to this market.

**Old Wheels.**—We hear of a sale of 200 tons. We quote \$16.25 @ \$16.50.

**Rail Fastenings.**—The market is dull. Quotations for large lots are 2.6¢ @ 2.65¢ for Bolts and Square Nuts, and 2.8¢ @ 3¢ for Bolts and Hexagon Nuts. Railroad Spikes are quoted 1.8¢ @ 1.9¢.

## Philadelphia.

Office of The Iron Age, 230 South Fourth St., PHILADELPHIA, March 26, 1885.

**Pig Iron.**—There has been no change of importance during the past week, demand and supply having been in about equal proportion. With more seasonable weather it is thought that the demand would have been greater, but, as that in any case can be only a question of a few days, there is a general disposition to look for an improving market. As noted in last week's report, buyers discriminate closer than usual in their selection of brands, so that those of established character command full prices, and whatever of weakness or irregularity there is in the market is due to the pressure to realize on outside lots, or on such brands as are comparatively new and unknown. The amount of Pig Iron taken during the week is a fair average for the season, but there are still a considerable number of large consumers who as yet have made very little provision for their requirements, beyond the first quarter of the year. When these orders are placed it is expected that the surplus will be easily absorbed by the current demand for small lots. There is more uncertainty as to outside brands, as it is difficult to estimate either the supply or the demand. Some well-informed parties are of opinion that Southern Irons will soon find a better market in the Southwest than in this direction, and if that should prove correct it will help our market considerably, but there is nothing definite on that point, which, as a matter of fact, is probably the pivot upon which the course of the entire market will eventually turn. At the moment the demand for this class of iron is rather slow, and, while sellers are anxious to realize, they appear unwilling to make concessions, so that business is to a considerable extent held in abeyance. What the ultimate outcome will be remains to be seen. The asking prices for Alabama Irons are \$15, 16 and \$17 for the three grades, ex-ship, although offers at slightly less money might not be refused from good buyers. Standard brands of Pennsylvania and Virginia Irons are firmly held at \$16, \$17 and \$18, with from 50¢ to \$1 per ton additional on two or three special brands.

**Foreign Iron.**—There is very little inquiry at present, the enhanced ideas of sellers, owing to the advance in freights, standing in the way of new business. Spiegeleisen is held at from \$26 to \$26.50 for 20%; a small lot of 60% Ferromanganese sold at about \$50, with \$51 @ \$52 generally asked.

**Muck Bars.**—There is a fair demand for small lots at unchanged prices, say, \$26.50 @ \$27.50, delivered, according to quality.

**Blooms.**—There is no change, and prices remain as before, say, Steel Blooms at about \$31 @ \$32 for Nail Plate and \$35 @ \$36 for Plate and Sheet Blooms. Other descriptions are dull, and for the best makes quoted as follows: Charcoal Blooms at \$50 @ \$52; Run-out Anthracite, \$43 @ \$44; Scrap Blooms, \$35 @ \$36; Northern Ore Blooms, \$35.

**Bar Iron.**—The remarks of last week would apply equally well at this time, as there has been no change whatever. Prices are as unsatisfactory as ever; the demand is possibly a shade better, but not such as to encourage any one who wants business to ask even a fractional advance over previous quotations. It is thought that business would have been considerably better with ordinarily seasonable weather, but the extreme cold has interfered greatly with outdoor operations. An increasing volume of business is hoped for within the next two or three weeks, and, while it is doubtful if any advance in prices can be realized, more work for the mills is counted upon with considerable confidence. Prices remain as last quoted, viz., 1.5¢ for Common; 1.6¢ @ 1.7¢ for good Medium quality, and 1.8¢ for Best Refined. Skelp Iron has been in fair demand, with several lots taken at about 1.8¢.

**Structural Iron.**—Business during the week has not been of special importance, although there has been a renewal of inquiries and negotiations which promise a large amount of work as soon as the details can be arranged. The great difficulty is to arrange satisfactory payments. At the low prices now prevailing, manufacturers cannot afford to take risks; hence cash or undoubted security is an essential condition, but unfortunately is not readily obtainable with much of the business that is offered. Still, there is a reasonable probability that contracts will soon be closed which will employ the mills for several weeks to come, which, with the usual demand for small lots, will carry them well

forward toward summer. Prices remain as before, viz.: 2¢ @ 2.1¢ for Angles, 2.1¢ @ 2.15¢ for Bridge Plate, 2.5¢ for Tees, and 3¢ for Beams and Channels.

**Plate and Tank Iron.**—Business has been very quiet during the past week or 10 days, and the mills are again running close to the end of their orders. Inquiries have been smaller than usual, and at the moment prospects are not at all encouraging. Meanwhile prices remain about as before, viz.: Ordinary Plate, 2¢; Tank, 2¢ @ 2.1¢; Shell, 2.5¢; Flange, 3.5¢; Fire Box, 4.25¢; Steel Plates, Flange, 3.5¢ @ 3.75¢; Fire Box, 4¢ @ 4.25¢.

**Sheet Iron.**—The demand shows some increase, and manufacturers report a very satisfactory amount of business, although there is no improvement in prices. Quotations for small lots remain as before, viz.: Best Refined, Nos. 26, 27 and 28, 3.15¢; Best Refined, Nos. 18 to 25, 3.15¢; Common, 1/4¢ less than the above. Best Bloom Sheets, Nos. 26 to 28, 4.15¢; Best Bloom Sheets, Nos. 22 to 25, 4.15¢; Blue Annealed, 2.5¢; Best Bloom, Galvanized, discount, 60¢; Second quality, discount, 62 1/2¢; Common, discount, 65¢.

**Wrought-Iron Pipe.**—Considering the condition of the weather during the past week, a fair amount of business has been transacted. Manufacturers anticipate a good demand as soon as the season opens, and are confirmed in their anticipations by the amount of inquiries now on the market. Discounts remain unchanged at about as follows for ordinary-sized lots: Butt-Welded Black Pipe, 45 @ 47 1/2%; Lap-Welded Black, 65 @ 67 1/2%; Butt-Welded Galvanized, 35 @ 37 1/2%; Lap-Welded Galvanized, 45 @ 47 1/2%; Boiler Tubes, 57 1/2 @ 60%.

**Steel Rails.**—The market has not shown much activity, but prices are steady, and on light sections a shade firmer. Leading mills in Pennsylvania are well supplied with orders, and, unless at from \$27.50 to \$28, they are not much inclined to enter into new engagements. On the whole, therefore, the market may be called firm, although there is great activity for the time being.

**Old Rails.**—The offerings are somewhat larger than they have been, and holders have modified their ideas to about \$18 at tide. Buyers show no disposition to advance their bids, however, \$17 @ \$17.50 being their ideas of value, according to quantity, point of delivery, &c. At interior points \$18.50 has been paid, and it is still obtainable for deliveries at certain points, although, on the whole, the feeling is rather easier than it was some time ago.

**Old Material.**—There is an increasing demand, and, as there is quite a scarcity of choice lots, prices are higher, and may be quoted about as follows: No. 1 Wrought Scrap, \$18 @ \$19; No. 2 do., \$12.50 @ \$13.50; Horse Shoes, \$22.50; Turnings, \$13.50 @ \$14; Old Car Wheels, \$15 @ \$16; Old Steel Rails, \$15.50 @ \$16; Fish Plates, \$22; Cast Scrap, \$13.50 @ \$14; do. Turnings, \$9.50 @ \$10.

**Nails.**—A fair demand for Nails is reported. Prices are unchanged, and are quoted with some degree of firmness. The demand for Steel Nails appears to be on the decrease, at least for the present. In small lots Iron Nails are selling at, say, \$2.30, and Steel Nails at about \$2.40.

## Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue, PITTSBURGH, PA., March 24, 1885.

The continued cold weather is very much against general business, which cannot be expected to improve much so long as the mercury keeps down below freezing and the frost from 2 to 3 feet deep in the ground. Very little progress has been made in the way of building, and it is evident that farm-work will be from two to three weeks later than usual this spring. This applies not only to this section of the country, but the West as well, where the winter has been unusually severe.

In labor circles there has been nothing important developed, with the exception that the indications are that the bottom is about to fall out of the coal miners' strike in the Monongahela Valley. It is reported that a number of the miners in the upper pools have resumed work at the old rate, and it is expected that others will follow within the next few days. The operators claim that they cannot pay the price demanded by the miners and compete with Kanawha River and other Coals in the down-river markets. Some of the miners are still hopeful of forcing the operators to terms, but the outlook, as already intimated, points in the opposite direction.

The extension asked for by Graff, Bennett & Co. has been granted, and this firm are now in good shape again, and, with anything like business, will be able to pay their creditors in full, dollar for dollar. Oliver Bros. & Phillips, it is said, have got their affairs in such a condition that they will be able to start up in full blast before long if there is demand for their product. The most remarkable event of the past week was the suspension of river navigation by ice. This is unexampled at this time of year, and is a serious drawback just now, but it is not likely to last more than a day or two.

**Iron Ore.**—There is more talk about Ores, and while some contracts have been made they are chiefly for near-by delivery. Advice from Cleveland report that contracts for about 300,000 tons of Lake Ore have been made thus far. Republic Ore is still quoted at \$5.50 per ton, delivered on the dock at

Cleveland. Freight from Cleveland to Pittsburgh, \$1.25 per ton; an effort is being made to get the rate down to \$1.

**Pig Iron.**—There has been no important change in the situation during the week under review. The consumption, possibly, is increasing somewhat, but the demand is still of a hand-to-mouth character, and the indications are that it will continue so until there is a very decided improvement in the outlook. The furnaces in blast are generally contracted ahead, but there is still a good deal of iron in second hands that is on the market, some of which is being pressed. Some of the banks, insurance companies, as well as individuals, are still holding a good deal of the Marshall Iron, taken as collateral on money; those who sold out at first did much better than those who have been carrying it for years in hopes of striking a better market. It is this hypochondriacal iron that is bearing the market more than anything else, and the sooner it gets into the hands of consumers the better for all concerned. There are some good brands among these hypochondriacal Irons, but they are generally offered in mixed lots, probably half a dozen different makes in a block, and the buyer has to take them all; and, as a consequence, consumers generally prefer to pay the difference and buy some particular make with which they are familiar to taking the chances on these mixed lots. Prices, although weak, remain substantially as noted in our last report:

Neutral Gray Forge	\$15.00 @ \$15.50, 4 mos.
All-Ore Mill Iron	16.50 @ 17.00, 4 "
White and Mottled	14.00 @ 14.50, 4 "
No. 1 Foundry	17.50 @ 18.00, 4 "
No. 2 Foundry	19.00 @ 19.50, 4 "
Cold-Blast Charcoal	25.00 @ 27.00, 4 "
Bessemer Iron	17.50 @ 18.00, 4 "

**Muck Bar.**—There have been no sales reported, in the absence of which we continue to quote at \$27 @ \$27.50, cash, at mill.

**Manufactured Iron.**—The general position of the market remains unchanged; demand continues light for the season, but it is expected that there will be an improvement soon after the advent of good weather, and the latter cannot surely be much longer delayed. Stocks in the hands of jobbers and consumers are very much reduced, and will soon have to be replenished, and this is about the only encouraging feature apparent at the present time. Prices are still quoted on a basis of 1.65¢ @ 1.75¢ for first quality iron, 60 days, with the usual discount of 2% for cash.

**Nails.**—The Iron Nail trade continues dull for the season, while makers of Steel Nails continue to report a good business. Prices are still quoted at \$2.25, 60 days, 2% off for cash, with a rebate of 10¢ per keg on car lots and upward. It is intimated that there is a disposition to cut, and that a desirable order could be placed below regular card rates. There is to be a special meeting of the Western Nail Association to-morrow.

**Wrought-Iron Pipe.**—There has been more inquiry the past week, and an increased trade is looked for as soon as the weather is more seasonable and frost gets out of the ground. Prices remain about as last quoted. Discount on Black Butt-welded Pipe, 1 1/4-inch and smaller sizes, 50%; Galvanized do., 40%; on Black Lap-welded, 1 1/2-inch and larger sizes, 50%; Galvanized do., 67 1/2%; Selected Pipe or Pipe cut to specified lengths, discount 5% less than rates quoted. Discount on Boiler Tubes, 60%. Two-inch Oil Well Tubing, 10¢ @ 11¢ per foot, net; 5 1/4-inch Oil Well Casing, 36¢ @ 37¢, net.

**Steel.**—For some specialties there is an active demand, but the general merchant trade is dull for the season. Best brands Refined Cast Steel still quoted at 9¢; do. Crucible Machinery, 4 3/4¢; do. Open hearth and Bessemer, 3¢. Those mills making a specialty of Steel Nail Slabs are very busy, being sold a good deal ahead of their production, and the demand still appears to be on the increase. It is stated that other of Steel mills in addition to those already making these Nail Slabs intend to turn their attention to the Slab trade.

**Old Rails.**—Continue in small supply for immediate delivery, but it is expected as soon as the weather becomes warm, so that the work of lifting can be commenced, the offerings will be more liberal. We are reported sales of Old Iron Rails at \$19.50 for delivery this month, and \$19 for deliveries later on in the season. Old Steel Rails for near-by delivery, \$16 @ \$17, according to length.

**Steel Rails.**—Are still quoted at \$27, cash, at mill for Heavy Sections. It is stated that the Edgar Thomson Company have orders enough booked to absorb their production for several months to come. It is stated that the Pennsylvania Railroad Company will put down a good many Steel Rails the coming summer, and it is probable that the very low price now obtaining will tend to increase the demand.

**Railway Track Supplies.**—The demand continues light, while prices remain unchanged: Spikes, 2¢, 30 days; Splice Bars, 1.6¢ @ 1.7¢; Track Bolts, 2.35¢ @ 2.4¢ with Square and 2.5¢ @ 2.6¢ with Hexagon Nuts.

**Crop Ends.**—New Steel Rail Ends continue scarce, with considerable inquiry, and prices are steady at \$13 @ \$13.50; Steel Bloom Ends quoted at \$17.50 @ \$18.

**Scrap.**—There is rather more doing, but no improvement in prices. No. 1 Wrought Scrap, \$16 @ \$17 per ton; Wrought Turnings, \$13 @ \$14; Old Car Axles, \$24 @ \$25; Cast Boring, \$11 @ \$12, gross; Old

Car Wheels—last sale reported was at \$16, gross ton.

**Wind and Glass.**—Demand continues light, while prices remain unchanged. Discount on Single Strength, in car lots, 70 and 5%; Double Strength, 70 and 10 and 5%.

**Coke.**—There has been little or no change recently in the situation; business continues light, but all that can be expected in view of the depression in the iron business. Blast-Furnace Coke still quoted at \$1.10 per ton on cars at ovens.

## Chicago.

Office of The Iron Age, 36 and 38 Clark St., Cor. Lake St., Chicago, March 23, 1885.

**Hardware.**—Jobbers complain that zero weather is not a good time to sell spring goods, and from the rural districts we learn that little or nothing can be done in outside work, making the consumption necessarily light and retail dealers chary of purchasing goods. From this it will not be understood that trade has fallen off or that jobbers are idle. Business is fairly active and shipments are fully up to a week ago, but for the season trade is not what it should be or what has been expected. Orders are perhaps quite as numerous, but in such small quantities that the aggregate sales make a much lighter footing than for the same period last year. The continued slow trade is increasing the cutting in price by different houses, and on several lines it is altogether probable that a lower price will become general through the force of competition.

**Barb Wire.**—As the greater portion of the buying of Barb Wire so far this season has been for prospective use, the conditions which affect other lines do not exert any influence over the Barb-Wire market. The demand continues to be strong, and many of the manufacturers are running their mills to their utmost capacity. No changes in prices are reported, and the market in all respects continues in about the same position as a week ago. Jobbers continue to quote Four-Point, Painted, 3 3/4¢, and Two-Point, Painted, and Four-Point Hog Wire, 4 1/4¢, and Two-Point Hog Wire at 4 3/4¢, with 1¢ additional added for Galvanized. Carload lots are quoted 1/8¢ off these prices. While these figures are said to be firm and steady, it is not unlikely that a change will occur very shortly. Makers are agitating the advancing of price on all grades, and the subject will be discussed and perhaps acted upon at their next meeting.

**Nails.**—The demand for Nails has been very good, all things considered. Orders have fallen off some in size, but very little in number, making shipments to single buyers, perhaps, less, but the aggregate sales are fully up to that of a week ago. Prices are unchanged and quotations continue to be \$2.25, 2% off, 60 days, in carload lots, and \$2.30 in smaller lots, for Iron Nails. Steel Nails are still quoted at 5¢ additional per keg here, while in other markets they are sold at the same price as Iron Nails. Considerable uneasiness is displayed by jobbers as to what will be the action of the Nail manufacturers at their meeting in Pittsburgh this week; 10¢ per keg additional on Steel Nails is advocated here and will be strongly recommended to the manufacturers at their meeting. On the difference in price between Steel and Iron Nails hangs the future of the market. The experience of the past three months has made it evident that it is not advantageous to sell Steel and Iron Nails at the same price. The non-uniformity of Steel Nails is still commented on as being a barrier to their permanent success. But should this be overcome they undoubtedly would be taken in preference to Iron Nails at 5¢ advance in price, and it is supposed that 10¢ per keg in a retail way would be nearer the figure which would equalize trade.

**American Pig Iron.**—Reports from different Pig-Iron markets in Wisconsin, Michigan and dealers and agents in this city all agree that the market is very dull for the season. Sales in this market for the week would scarcely aggregate 5000 tons in all classes of iron. Those that have been made are principally for carload lots, and many of them experimental orders on a different brand of iron from any that have been prominent heretofore. From what can be learned the only feature that has caused demand was the contracts for Railroad Cars which were placed several weeks ago, and obtained by makers in the vicinity of Detroit, from which point most of the Lake Superior Charcoal Iron has been disposed of. Nos. 1 and 2 Lake Superior Charcoal are quoted \$20.50, and No. 3 at \$21, with no demand whatever for Nos. 4, 5 and 6, which are, nominally, quoted at \$22.50. All-Ore Coke Iron is quoted at \$20, while Cinder Mixed is quoted \$18 @ \$18.50. There is a little better feeling in Ohio Irons than was noticeable for some time past, and a few more orders have been placed for Ohio Standard Black Bands, which are quoted \$20 @ \$20.50. Southern Irons have not recovered from the quietness of a week ago, and very few sales are reported. No. 1 is scarce, and it is doubtful whether there is any at all in the market at present. There has been some selling of No. 2 Southern in carload lots at figures variously reported at \$16.50 @ \$17, four months. By some furnaces the latter figure is claimed to be bottom and firm, but there are those who are willing to accept the former figure. But, upon the other hand, it is said that the difference is to be found in the quality of the iron. Several sales of round lots of No. 3 Foundry have been made during the week,



penner were numbered. The propeller is placed on the deck at the stern of the canal-boat, and when running the paddles extend several feet over the water. It is operated by a 4-horse-power engine.



# Trade Report.

## General Hardware.

There is little to add to the statement of the situation as given in our review of the general aspect of the market in our last issue. A number of manufacturers in special lines report that they are doing a satisfactory trade, but the complaint is quite general that business is light and unremunerative. The continuance of cold weather is frequently referred to as having a depressing effect upon trade, and with the opening of the season it is expected that business will show a decided improvement. There are not many important changes in price to be noted, but the market does not show that firmness which it was hoped might characterize it at this time.

### BARB WIRE.

The spring demand has not yet set in in this market, although a better inquiry is reported from the South and prices are firmer in the West. Here the maintenance of figures current thus far are kept ruling largely through the competition of a leading maker and through the fact that dealers have not yet disposed entirely of stock bought earlier in the year. We quote for carload lots of Four-Pin Galvanized Barb Wire, 4.75 cents @ 4.8 cents, and for small lots, 5 cents @ 5 1/4 cents.

### NAILS.

The cold weather of the greater part of the past week, with its effect upon all industries dependent upon the building trades as their chief customer, has made the Nail market a quiet one. The stocks in the hands of Eastern manufacturers and their agents are fair. Manufacturers' agents quote large lots of Iron Nails steady at \$2.20, and Steel Nails, \$2.30 @ \$2.35. On large orders some outside sellers make concessions. Quotations for small lots from store remain without change at \$2.30 @ \$2.35 for Iron, and \$2.40 @ \$2.45 for Steel Nails. As will be noted from their announcement on page 32, the Junction Iron Company, of Wheeling, W. Va., have begun the manufacture of Steel Nails. The works, which have a capacity of 7000 kegs per week, are located on the Ohio River junction of the P. C. & St. L. and Cleveland and P. railroads.

W. J. Houston, manager of the Pacific Iron and Nail Company, of San Francisco, Cal., has given the following data to a local newspaper. It gives a summary of the statistics relating to the Pacific Coast market:

Owing to a lockout during the year 1884 our output was only 129,342 kegs of Nails, and of this number we had on hand at the close of the year 21,561 kegs. During the year 1885 we expect to turn out at least 200,000 kegs of Nails, which we estimate, with the present stock on hand, will supply the entire Pacific Coast trade. Should we find, however, an increased demand for more Nails, it will be a very easy matter for us to supply the demand, as some of the mills in the East of the same capacity produce annually about 300,000 kegs. So there is no danger of a scarcity of Nails on the Pacific Coast. During the year 1884, through the erection of new factories and the increased production of some of the old ones, it was supposed that there were more Nail Machines running than was required to supply the demand. This caused a general demoralization in prices, and at the close of the year Nails were being sold at the lowest price ever known in the history of the Nail trade. Now, at the close of the year, when we come to take a general survey of the whole situation, we find that Nail machines did not increase faster than the demand, for during the year 1884 the demand for Nails exceeded largely that of any previous year in the history of the United States, and it is a recognized fact that the demand for Nails during the year 1885 will exceed that of any previous year, and at the present time there is a fair degree of activity, with indications of a gradual upward tendency in prices for the entire year. Below we give a tabular statement of all Nail imports, consumption, &c., for the past 21 years, which are as follows:

Years.	Imports.	On the way Dec. 31.	Stock Dec. 31.	Supply for the year.	Consumption per year.	Consumption per month.
1864.	94,861	30,000	40,000	164,371	114,361	9,530
1865.	70,314	28,000	30,000	128,314	88,314	7,359
1866.	103,008	33,443	45,000	181,451	122,008	10,167
1867.	100,831	44,370	45,000	190,201	121,831	10,152
1868.	158,208	45,366	51,000	254,574	174,208	14,517
1869.	170,612	46,027	48,000	264,639	184,612	15,384
1870.	168,962	47,702	45,000	261,664	182,962	15,246
1871.	150,212	60,872	13,500	224,584	161,712	13,476
1872.	225,000	45,000	25,000	295,000	215,000	17,916
1873.	120,000	30,000	30,000	180,000	130,000	10,833
1874.	214,954	47,023	25,000	286,977	214,954	17,829
1875.	221,740	61,106	35,000	297,746	221,740	18,478
1876.	163,700	79,701	0,000	243,401	163,700	13,641
1877.	217,400	54,957	25,000	297,357	217,400	18,116
1878.	180,300	81,100	36,905	298,305	180,300	15,025
1879.	135,842	39,450	10,000	185,292	135,842	11,320
1880.	158,496	35,122	10,000	203,618	158,496	13,208
1881.	228,577	14,250	30,000	272,827	228,577	19,048
1882.	193,402	30,000	30,000	253,402	193,402	16,116
1883.	175,451	8,000	30,000	213,451	175,451	14,620
1884.	113,010	8,000	55,000	176,010	113,010	9,417

\* Including the whole coast, by sea and rail.

The total number of kegs imported by rail, steamer and sail to all points of the Pacific Coast during the year were 134,000; manufactured by the Pacific Iron and Nail Company, 129,332; stock on hand December 31, 1884, 30,700; total, 304,032 kegs. The lockout at the Pacific Iron and Nail Company somewhat disturbed the harmony of things, but not severely, and the manufacture of Nails may now be regarded as firmly established on the Pacific Coast as that of flour or sugar. During the year the Pacific Iron and Nail Company have added to their plant a line of French Wire Nail machines and are now prepared to turn out all sizes and kinds of French Wire Nails. The demand for Wire Nails in the past three years

has exceeded that of the previous 15 years, and they are now being used largely by all saw, door, furniture and organ manufacturers, picture frame makers, carbuilders and house and office furnishers, and the reason for the change from Cut to Steel Wire Nails is because they are much cheaper, there being more Nails to the pound, they are exceedingly stiff and will not split or break while driving into hardwood, and the use of the Brad-Awl is unnecessary, and it is found that all work is much stronger when manufactured with Wire Nails.

Our readers will learn with regret of the death, on Sunday last, of

### CORNELIUS B. ERWIN,

at his home in New Britain, Conn. Although of late years he was not brought into contact with the trade at large, he was widely known to the Hardware trade of the entire country as one of the founders of the Russell & Erwin Mfg. Co., of which he has been president since its organization, and has, besides, long held an influential position in New England as one of its most prominent manufacturers and a leading business man. He was born in Booneville, N. Y., in 1811. His father being a shoemaker, he learned that trade and worked at it until he attained his majority, when he went to New Britain and entered as a workman in the employ of North & Stanley, manufacturers of articles of Cast Brass. In 1835 he became a junior member of Belden, Lee & Co., Brass founders. The next three years he was in partnership with George Lewis, under the style of Erwin & Lewis, the house being engaged as manufacturers of Cast Brass Goods. On the first of January, 1839, he entered the firm of Stanley, Russell & Co., of which he and Henry E. Russell were active partners, thus beginning his connection with the house of which he was subsequently for many years the president. Their leading branch of manufacture was Door Locks of the cheaper grades, chiefly Plate Locks, and a line of miscellaneous Brass Goods, such as Andirons and other Fireplace Fixtures and utensils then in general use, small articles of Cast Brass, and Sleigh Bells, of which it is said they manufactured the first produced in the United States. In the following year, 1840, the firm became Mattison, Russell & Co., and established a warehouse in this city for the sale of their goods at 92 John street, which was removed in 1850 to 24 Cliff street, and in 1854 to 55 Cliff and 87 Beekman streets, being transferred to its present location, 45 and 47 Chambers street, in 1868. The partnership continued without change of name until January 1, 1846, when it became Russell, Erwin & Co., but, their business increasing from year to year, on the 1st of January, 1851, it was organized as a joint-stock company under its present style, the Russell & Erwin Mfg. Co., Mr. Erwin being its first president, a position which he occupied with conspicuous ability and success until his death. Besides this connection with the company with which he was identified and most widely known to the Hardware trade, Mr. Erwin was president of the New Britain National Bank, a director in the Stanley Works, American Hosiery Company, Stanley Rule and Level Company, Landers, Frary & Clark, Phoenix Fire Insurance Company, Travelers' Insurance Company, Connecticut General Life Insurance Company, William L. Company, and until last year in the Wheeler & Wilson Sewing Machine Company, besides being a stockholder in many manufacturing corporations in New Britain and others in Waterbury and Meriden. This statement will indicate to our readers his influential position as connected with the business interests of his State.

Among the traits which contributed to this exceptionally successful career and the esteem and respect in which Mr. Erwin was held, reference is made to his sterling integrity and uncompromising honor in all business relations, the wisdom of his deliberate and clear-sighted judgment, and the perseverance, energy and exactness which were so characteristic of him. A prominent man of broad views, public spirit and high character, the estimation in which he was held was indicated by the presence at his funeral to-day of representatives of the leading manufacturing and financial interests of his State, and is evidenced by the many appreciative tributes which are paid to his worth.

### THE CENTRAL STAMPING COMPANY.

In this issue we give the concluding portion of the Central Stamping Company's list, the section that we publish to-day covering, it will be observed, a very complete line of Heavy Polished Tinware, Planished Ware, Britannia, Copper and Brass Goods, Galvanized, Black and Japanned Sheet Iron Ware, as well as a variety of miscellaneous articles. We may remind the trade that every article comprised in the list which we have thus been able to give the trade in four successive issues is manufactured by the Central Stamping Company, the patterns, sizes and lines being carefully selected, modifications and improvements having been made in the goods of nearly all classes and new articles added. The trade will thus perceive the extent of the line manufactured by this company, and will recognize the importance, from a trade standpoint, of the publication of this list thus complete and revised. It will unquestionably be adopted as the standard list by other manufacturers in this line, and prices will be made by reference to-day is 33 1/2 per cent., as on the rest of the list, as heretofore announced.

### P. & F. CORBIN,

New Britain, Conn., and 21 & 26 Murray street, New York, have issued a new illustrated and descriptive catalogue and price list of the Hardware of their manufacture. It is a large and attractive volume of more than 600 pages, fully illustrated, well printed and very conveniently arranged. In its preparation, they state in their opening circular, that they have aimed to bring together all goods of corresponding class, and to furnish full and complete lines of the different styles, so that parties in selecting Hardware for dwelling-houses and public buildings will be able to match the style of architecture with goods that harmonize in every respect. The first half of the volume is devoted to a large line of miscellaneous goods, such as Butts and Hinges, Gate Latches, Bolts, Bell Trimmings, Cupboard, Window and other Catches, Door Pulls, Push Plates, Handles, Sash Fasteners, Bright Wire Goods (a recent addition to their line) Coat, Hat, Bird Cage and other Hooks, Door Sheaves, Axle Bolts, &c., closing with Screws. The remainder of the book is devoted to Door Locks, Latches and Furniture, to the display of which more than 300 pages are devoted. The arrangement of these goods will be seen to be a departure from the plan they have heretofore followed, and its convenience will be recognized and appreciated by the trade, as every Lock, with the variety of fronts and strikers with which it is furnished, is exhibited upon a single page or on consecutive pages. The list also includes many new goods which have been added, special attention being directed to the new styles in Genuine Bronze Metal or Polished Brass, among which is the Venetian pattern, lately introduced. They also express the assurance that the trade will appreciate the "Bassett Patent Lock Marker" as meeting the demand that has long prevailed, adding that all their Mortise Locks are packed with this common-sense marker, thus enabling carpenters to make exact mortises rapidly and without the usual annoyances. With the catalogue they send out a card giving the list prices of Iron Screws, with the net prices at the different discounts, 55, 60, 65, 70 and 75 per cent., the prices at each discount being printed in a different colored ink.

With the catalogue they issue a discount sheet, which is divided into three sections, Section 1 covering all goods except Locks, Knobs, Escutcheons, Bell Pulls, &c., named in Sections 2 and 3; Section 2 covering the line of Locks, Knobs, &c., in combination, but not including the Bronze Metal Locks, Knobs, &c., which are given in Section No. 3. The discounts on their miscellaneous goods are as follows, an extra discount of 10 per cent. for prompt cash applying to the whole line, except pages 1, 2 and 3 (covering Wrought Brass Butts) and cases where the price is stated to be cash:

Wrought Brass Butts.	Dis. per cent.
Brass.....	55
Whitened and Polished.....	55
Nickel-Plated or Bronzed, Polished.....	33 1/2
Wrought Brass Shutter Hinges.	
No. 09.....	80
No. 9, Bronzed.....	33 1/2
No. 19, Whitened and Polished.....	33 1/2
No. 029, Polished.....	33 1/2
No. 1029, Imitation Bronzed.....	33 1/2
No. 29, Nickel-Plated.....	33 1/2
Wrought Brass Piano Butts.....	55
No. 108 Cast Brass Butts.....	33 1/2
No. 104, Cast Brass Butts.....	33 1/2
No. 104 1/2, Bronze Metal Butts.....	33 1/2
No. 106 and 107, Cast Brass Butts.....	33 1/2
No. 100 and 101, Cast Brass Butts.....	40
No. 104 1/2, Bronze Metal Butts.....	33 1/2
No. 108, Cast Brass Butts.....	33 1/2
No. 102 1/2, Bronze Metal Butts.....	33 1/2
No. 100 and 110, Cast Brass Butts.....	33 1/2
No. 112, Bronze Metal Butts.....	33 1/2
No. 110, Cast Brass Butts.....	33 1/2
No. 115 1/2, Bronze Metal Butts.....	33 1/2
Parliament Butts.	
Nos. 018, 018 and 0119.....	50
Nos. 118 and 119.....	50
Nos. 128 and 132.....	33 1/2
Nos. 129 1/2, 129 1/2 and 130 1/2.....	33 1/2
Nos. 19 1/2, 20, 21 and 22.....	70
Nos. 23, 24 and 24 1/2.....	45
All on page 11.....	65 1/2
Nos. 37 and 37 1/2.....	65 1/2
Nos. 17 and 17 1/2.....	65 1/2
Shutter Butts, all on pages 13 and 14.....	70
Nos. 7 and 8, Shutter Flaps.....	70
No. 120, Three-Fold Flaps.....	50
Shutter Flaps, all on page 15.....	70
Loose Joint Iron Butts.	
All on page 16.....	70
Nos. 42, 42 1/2, 44 and 44 1/2.....	60
Loose Joint Amber Butts.....	80
No. 114, Loose Joint Amber Butts.....	80
No. 57 1/2, Loose Joint Amber Butts.....	80
No. 102 1/2, Loose Joint Amber Butts.....	80
No. 59 1/2, Loose Joint Amber Butts.....	60 1/2
No. 24, Loose Joint Amber Butts.....	60 1/2
No. 24 1/2, Loose Joint Amber Butts.....	60 1/2
No. 34 1/2, Loose Joint Amber Butts.....	75
No. 34 1/2, Fast Joint Amber Butts.....	75
No. 34 1/2, Loose Joint Amber Butts.....	65 1/2
No. 64, Loose Joint Amber Butts.....	65 1/2
No. 65 1/2, Loose Joint Amber Butts.....	60
No. 68, Loose Joint Amber Butts.....	60
No. 60, Loose Joint Amber Butts.....	65 1/2
No. 62, Loose Joint Amber Butts.....	65 1/2
Nos. 5 and 15, Loose Joint Butts.....	70
No. 25, Loose Joint Butts.....	60 1/2
No. 34 1/2, Loose Joint Butts.....	65 1/2
No. 34 1/2, Loose Joint Butts.....	60
No. 3, Loose Joint Butts.....	70
No. 4, Fast Joint Butts.....	70
No. 58, Loose Pin Butts.....	75 1/2
No. 71, Loose Pin Butts.....	75
Nos. 52, 53 and 54, Loose Pin Butts.....	70
Nos. 50 1/2 and 56, Loose Pin Butts.....	75 1/2
Nos. 57 and 57 1/2, Loose Pin Butts.....	75 1/2
No. 58, Loose Pin Butts.....	70
No. 59, Loose Pin Butts.....	60 1/2
Nos. 51 and 61, Loose Pin Butts.....	65 1/2
Union Spiral Spring Hinges, Japanned.....	35 1/2 cash
Union Spiral Spring Hinges, Plain.....	30 1/2 cash
Seymour's Gate Hinges and Latch.....	45
Seymour's Blind Hinges and Catch.....	70 1/2 cash
Automatic Blind Fixtures.....	25 cash
Pin Hinges.....	60
Central Joint Hinges.....	50
Stay or Support Hinges.....	55
Quadrant Hinges.....	40
Wardrobe Hinges.....	40
Ox-Ball Hinges.....	60 1/2
Flush Bolts, all on page 54, 55 and 56.....	60, 10 1/2
Flush Bolts, all on page 57.....	50
Flush Bolts, Nos. 423 and 248.....	70
Flush Bolts, Nos. 423 and 248.....	70
Flush Bolts, No. 423.....	50
Flush Bolts, all on page 63 except No. 248.....	50
Flush Bolts, No. 248.....	65

Extension Flush Bolts, all.....	70
Extension Spring Flush Bolts, all.....	65
Nos. 3471, 3473, 3491, Extension Spring Flush Bolts.....	65
Nos. 3470, 3472, 3490, Flush Bolts.....	50
Store Door Double Bolts.....	35
Double Bolts and Bars.....	35
Barrel Bolts.	
No. 590.....	60 1/2
Nos. 122 and 123.....	60 1/2
Nos. 2322 and 2323.....	60 1/2
Nos. 925, 926 and 927.....	60 1/2
Nos. 2925, 2926 and 2927.....	40
All on page 74.....	60 1/2
All on page 75.....	60 1/2
Nos. 325, 325A and 325B.....	60 1/2
All other Barrel Bolts.....	60
Mosquito Bar Bolts.....	50
Flat Ship Bolts.....	60 1/2
Straight Spring Bolts.....	60 1/2
Necked Spring Bolts, Brass.....	75
Necked Spring Bolts, Ornamental.....	60 1/2
Square Cast Door Bolts, Plain.....	60 1/2
Square Cast Door Bolts, Ornamental.....	70
Square Spring Bolts, all.....	70
Foot Bolts, all.....	70
Chain Bolts, all.....	70
Extension Door Bolts.....	60 1/2
Mortise Door Bolts.	
Nos. 650 to 653.....	60, 10 1/2
Nos. 122 to 123.....	60 1/2
All on page 57.....	60 1/2
Brass Ship and Side Flush Bolts.....	60 1/2
Brass Knob Flush Bolts.....	50
Book Case Bolts and Catches.....	60 1/2
Cupboard Bolts, all on page 12.....	60, 10 1/2
Cupboard Bolts, all on page 10.....	60, 10 1/2
Chain Door Fasteners, all on pages 91, 92 & 93.....	60 1/2
Chain Door Fasteners, all on page 94.....	60 1/2
Japanese Drawers on Plates.....	60 1/2
Turn Buttons on Plates.....	60
Turn Buttons.....	60 1/2
Mouth Pieces.....	25
Letter-Box Plates.....	60 1/2
Amber Bronze Metal, \$5 doz., and 2500.....	60 1/2
Bronze Metal, \$18 doz., and 2500.....	60 1/2
Newspaper-Box Plates.....	60 1/2
Crank Door Bells.....	50
House Bells.....	50 1/2
French Window Catches, Japanned and Brass.....	60 1/2
Mortise Cranks.....	60 1/2
Check Springs.....	70
Gong Door Bells.....	60 1/2
Bell Levers.....	60 1/2
Slide Bell Pulls.....	55 1/2

Bell Pulls.	
Parlor Bell Levers.....	33 1/2 cash
Rural Cupboard Catches.....	60, 10 1/2
Rim Cupboard Catches.....	60
Cupboard Catches, all on page 122.....	60, 10 1/2
Cupboard Catches, all on page 123 except No. 685.....	60 1/2
Cupboard Catches, No. 685.....	60
Cupboard Catches, Amber Bronzed.....	60
Cupboard Catches, Bronze Metal.....	50
French Window Catches, all.....	60 1/2
French Window Catches, Japanned and Brass.....	60 1/2
French Window Catches, Nos. 2570 1/2 to 2572 1/2.....	55
Transom Window Catches.....	50
Rural Cupboard Turns, Plain.....	60
Rural Cupboard Turns, Ornamental.....	60, 10 1/2
Cupboard Turns, all on page 124.....	60, 10 1/2
Cupboard Turns, all on pages 124 and 125.....	60
Screen Door Catches.....	60, 10 1/2
Cupboard Catches.....	60 1/2

Cupboard Catches.	
Nos. 327 to 327 1/2.....	60 1/2
Nos. 326 and 326 1/2.....	60 1/2
Nos. 328 and 328 1/2.....	50
Show-Case Catches, Plain.....	60 1/2
Show-Case Catches, Ornamental.....	60
Book-Case and Quadrant Catches.....	60

Lever Cupboard Catches.	
Except Nos. 4620 and 2100 .....	60&10
Nos. 4620 and 2100 .....	60
Escutcheons, Nos. 4620 and 2100 .....	60, 10&10
Top Catches .....	50
Refrigerator Catches .....	50
Gate Catches .....	50
Table Catches .....	50
Surface Drawer Handles, Plain .....	50
Thread Escutcheons .....	60
French Circular Escutcheons .....	50
Locker Rings and Quadrants .....	50
Cottage Latches .....	60&10
Door Handle and Latch .....	50
Japanese Thumb Latches .....	60&10
Roggin's Thumb Latches .....	60&10
Barn Door Handles .....	60&10
Store Door Handle and Latch .....	60&10
Store Door Handle and Lock .....	60
Barn Door Pulls .....	70
Door Pulls, all .....	60&10
Bar Handles .....	50
Push Plates .....	40
Drawer Pulls .....	70
Drawer Pulls .....	70&10
Surface Drawer Handles .....	55
Surface Drawer Handles, Plain .....	50
Surface Drawer Handles, Amber Bronze .....	50
Surface Drawer Handles, Bronze Metal .....	25
Brass Lifting Handles .....	60&10
Window Shutter Handles .....	50
Flush Bolts .....	70
Chest Handles (change list 01871 to \$1.75 per dozen) .....	70
Chest Handles .....	70
Sash Fasteners .....	70
Sash Fasteners, Nos. 434 to 438 .....	65&10
Sash Fasteners, all others on page 208 .....	60&10
Sash Fasteners .....	75
Sash Fasteners, Nos. 439 and 439 1/2 .....	65&10
Sash Fasteners, all on page 210 and 211 .....	60&10
Table Fasteners .....	50
Cab Fasteners .....	50
Sash Lifts .....	65&10
Surface Sash Lift .....	65&10
Sash Lift and Lock .....	65&10
Sash Lift and Lock .....	



scribed as folding closely together, and as being stronger than common Ladders when extended, with the further advantage of making a safe and commodious Step-ladder, with room enough on top for a man and basket, and are spoken of as suitable for any purpose for which a common Step-ladder is adapted.

The following is the revised price list of the Lockwood Mfg. Co., South Norwalk, Conn., which shows the line of Locks, &c., which they manufacture, the list being subject to a discount of 70 and 3 per cent.

Locks and Latches.—In numerical order.

No.	Price, per doz.	No.	Price, per doz.
1	\$1.00	10	\$1.00
2	1.10	11	1.10
3	1.20	12	1.20
4	1.30	13	1.30
5	1.40	14	1.40
6	1.50	15	1.50
7	1.60	16	1.60
8	1.70	17	1.70
9	1.80	18	1.80
10	1.90	19	1.90
20	2.00	21	2.00
22	2.10	23	2.10
24	2.20	25	2.20
26	2.30	27	2.30
28	2.40	29	2.40
30	2.50	31	2.50
32	2.60	33	2.60
34	2.70	35	2.70
36	2.80	37	2.80
38	2.90	39	2.90
40	3.00	41	3.00
42	3.10	43	3.10
44	3.20	45	3.20
46	3.30	47	3.30
48	3.40	49	3.40
50	3.50	51	3.50
52	3.60	53	3.60
54	3.70	55	3.70
56	3.80	57	3.80
58	3.90	59	3.90
60	4.00	61	4.00
62	4.10	63	4.10
64	4.20	65	4.20
66	4.30	67	4.30
68	4.40	69	4.40
70	4.50	71	4.50
72	4.60	73	4.60
74	4.70	75	4.70
76	4.80	77	4.80
78	4.90	79	4.90
80	5.00	81	5.00
82	5.10	83	5.10
84	5.20	85	5.20
86	5.30	87	5.30
88	5.40	89	5.40
90	5.50	91	5.50
92	5.60	93	5.60
94	5.70	95	5.70
96	5.80	97	5.80
98	5.90	99	5.90
100	6.00		

Brass and Nickel-Plated Keys.

No. of class.	Price, per doz.	No. of class.	Price, per doz.
1	\$0.40	10	\$0.40
2	0.50	11	0.50
3	0.60	12	0.60
4	0.70	13	0.70
5	0.80	14	0.80
6	0.90	15	0.90
7	1.00	16	1.00
8	1.10	17	1.10
9	1.20	18	1.20
10	1.30	19	1.30
11	1.40	20	1.40
12	1.50	21	1.50
13	1.60	22	1.60
14	1.70	23	1.70
15	1.80	24	1.80
16	1.90	25	1.90
17	2.00	26	2.00
18	2.10	27	2.10
19	2.20	28	2.20
20	2.30	29	2.30
21	2.40	30	2.40
22	2.50	31	2.50
23	2.60	32	2.60
24	2.70	33	2.70
25	2.80	34	2.80
26	2.90	35	2.90
27	3.00	36	3.00
28	3.10	37	3.10
29	3.20	38	3.20
30	3.30	39	3.30
31	3.40	40	3.40
32	3.50	41	3.50
33	3.60	42	3.60
34	3.70	43	3.70
35	3.80	44	3.80
36	3.90	45	3.90
37	4.00	46	4.00
38	4.10	47	4.10
39	4.20	48	4.20
40	4.30	49	4.30
41	4.40	50	4.40
42	4.50	51	4.50
43	4.60	52	4.60
44	4.70	53	4.70
45	4.80	54	4.80
46	4.90	55	4.90
47	5.00	56	5.00
48	5.10	57	5.10
49	5.20	58	5.20
50	5.30	59	5.30
51	5.40	60	5.40
52	5.50	61	5.50
53	5.60	62	5.60
54	5.70	63	5.70
55	5.80	64	5.80
56	5.90	65	5.90
57	6.00	66	6.00
58	6.10	67	6.10
59	6.20	68	6.20
60	6.30	69	6.30
61	6.40	70	6.40
62	6.50	71	6.50
63	6.60	72	6.60
64	6.70	73	6.70
65	6.80	74	6.80
66	6.90	75	6.90
67	7.00	76	7.00
68	7.10	77	7.10
69	7.20	78	7.20
70	7.30	79	7.30
71	7.40	80	7.40
72	7.50	81	7.50
73	7.60	82	7.60
74	7.70	83	7.70
75	7.80	84	7.80
76	7.90	85	7.90
77	8.00	86	8.00
78	8.10	87	8.10
79	8.20	88	8.20
80	8.30	89	8.30
81	8.40	90	8.40
82	8.50	91	8.50
83	8.60	92	8.60
84	8.70	93	8.70
85	8.80	94	8.80
86	8.90	95	8.90
87	9.00	96	9.00
88	9.10	97	9.10
89	9.20	98	9.20
90	9.30	99	9.30
91	9.40		
92	9.50		
93	9.60		
94	9.70		
95	9.80		
96	9.90		
97	10.00		
98	10.10		
99	10.20		
100	10.30		

Jet Door Knobs.

No.	Price, per doz.	No.	Price, per doz.
1	\$0.50	10	\$0.50
2	0.60	11	0.60
3	0.70	12	0.70
4	0.80	13	0.80
5	0.90	14	0.90
6	1.00	15	1.00
7	1.10	16	1.10
8	1.20	17	1.20
9	1.30	18	1.30
10	1.40	19	1.40
11	1.50	20	1.50
12	1.60	21	1.60
13	1.70	22	1.70
14	1.80	23	1.80
15	1.90	24	1.90
16	2.00	25	2.00
17	2.10	26	2.10
18	2.20	27	2.20
19	2.30	28	2.30
20	2.40	29	2.40
21	2.50	30	2.50
22	2.60	31	2.60
23	2.70	32	2.70
24	2.80	33	2.80
25	2.90	34	2.90
26	3.00	35	3.00
27	3.10	36	3.10
28	3.20	37	3.20
29	3.30	38	3.30
30	3.40	39	3.40
31	3.50	40	3.50
32	3.60	41	3.60
33	3.70	42	3.70
34	3.80	43	3.80
35	3.90	44	3.90
36	4.00	45	4.00
37	4.10	46	4.10
38	4.20	47	4.20
39	4.30	48	4.30
40	4.40	49	4.40
41	4.50	50	4.50
42	4.60	51	4.60
43	4.70	52	4.70
44	4.80	53	4.80
45	4.90	54	4.90
46	5.00	55	5.00
47	5.10	56	5.10
48	5.20	57	5.20
49	5.30	58	5.30
50	5.40	59	5.40
51	5.50	60	5.50
52	5.60	61	5.60
53	5.70	62	5.70
54	5.80	63	5.80
55	5.90	64	5.90
56	6.00	65	6.00
57	6.10	66	6.10
58	6.20	67	6.20
59	6.30	68	6.30
60	6.40	69	6.40
61	6.50	70	6.50
62	6.60	71	6.60
63	6.70	72	6.70
64	6.80	73	6.80
65	6.90	74	6.90
66	7.00	75	7.00
67	7.10	76	7.10
68	7.20	77	7.20
69	7.30	78	7.30
70	7.40	79	7.40
71	7.50	80	7.50
72	7.60	81	7.60
73	7.70	82	7.70
74	7.80	83	7.80
75	7.90	84	7.90
76	8.00	85	8.00
77	8.10	86	8.10
78	8.20	87	8.20
79	8.30	88	8.30
80	8.40	89	8.40
81	8.50	90	8.50
82	8.60	91	8.60
83	8.70	92	8.70
84	8.80	93	8.80
85	8.90	94	8.90
86	9.00	95	9.00
87	9.10	96	9.10
88	9.20	97	9.20
89	9.30	98	9.30
90	9.40	99	9.40
91	9.50		
92	9.60		
93	9.70		
94	9.80		
95	9.90		
96	10.00		
97	10.10		
98	10.20		
99	10.30		
100	10.40		

Sash Fasteners.

No.	Price, per doz.	No.	Price, per doz.
29.....	\$3.00	30.....	\$6.15
45.....	5.20	35.....	15.06



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Genuine and Mechanics,  
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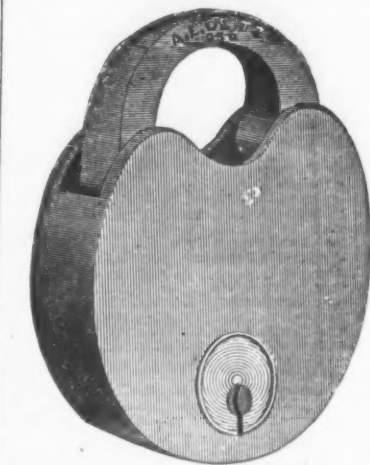
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**LAWN MOWER.**



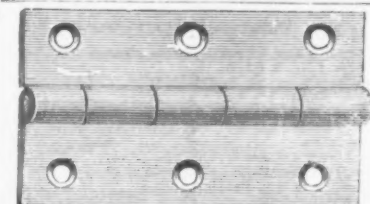
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## FISH HOOKS.

The following is the price list of the American Needle and Fish Hook Company, New Haven, Conn., for whom the A. Ford & Barke Company, 77 Chambers street, New York, are special agents. It gives the list prices on their line of Fish Hooks, which are subject to a discount of 40 and 10 per cent., and other additional discounts in large lots:

## Superfine Kirby Bent Fish Hooks.

These Hooks are packed in boxes of 100 Hooks each, and 10 of these boxes in an outside box, making a package of 1000 Hooks.

## Price per Thousand.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Superfine Limerick Fish Hooks, Spear Pointed.

Nos.	12-0	11-0	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.50	6.00	4.50	3.50	3.00	2.50	2.00
Ringed	13.00	11.00	9.00	8.00	6.50	4.50	3.50	3.00

## Superfine Limerick Fish Hooks, Hollow Pointed.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$12.00	10.00	8.00	6.50	5.00	3.75
Ringed	12.50	10.50	8.50	7.00	5.50	4.00

## New York Trout or Carline Hooks.

Nos.	4-0	3-0	2-0	1-0	1-1	1-2
Flatted	\$3.25	3.00	2.75	2.50	2.25	2.00
Ringed	3.50	3.00	2.50	2.00	1.75	1.50

## Packed in cartons of 10 boxes of 100 Hooks each, making a package of 1000 Hooks.

Nos.	4-0	3-0	2-0	1-0	1-1	1-2
Flatted	\$7.50	6.75	5.50	4.75	4.00	3.50
Ringed	7.75	6.75	5.75	5.00	4.25	4.00

## Aberdeen Trout Hooks.

Nos.	4-0	3-0	2-0	1-0	1-1	1-2
Flatted	\$4.50	4.00	3.50	3.00	2.50	2.00
Ringed	4.75	4.00	3.50	3.00	2.50	2.00

## Elastic Steel Kirby Bass or Salmon Hooks.

Nos.	3-0	2-0	1-0	1-1	1-2
Flatted	\$2.00	1.50	1.00	0.75	0.50
Ringed	2.25	1.50	1.00	0.75	0.50

## Superfine Kinsey Trout Hooks.

Nos.	6-0	5-0	4-0	3-0	2-0	1-0	1-1	1-2
Flatted	\$5.75	4.75	4.25	3.25	2.50	2.00	1.75	1.50
Ringed	6.00	5.00	4.50	3.50	2.75	2.25	2.00	1.75

## Packed in cartons of 10 boxes of 100 Hooks each, making a package of 1000 Hooks.

Nos.	6-0	5-0	4-0	3-0	2-0	1-0	1-1	1-2
Flatted	\$5.75	4.75	4.25	3.25	2.50	2.00	1.75	1.50
Ringed	6.00	5.00	4.50	3.50	2.75	2.25	2.00	1.75

## Genuine Virginia Fish Hooks.

Nos.	3-0	2-0	1-0	1-1	1-2
Flatted	\$2.00	1.50	1.00	0.75	0.50
Ringed	2.25	1.50	1.00	0.75	0.50

## Packed in boxes of 100 Hooks each.

Nos.	3-0	2-0	1-0	1-1	1-2
Flatted	\$1.00	0.75	0.50	0.375	0.25
Ringed	1.25	0.75	0.50	0.375	0.25

## Best I. P. Cod or Blue-Fish Hooks—Japanned.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$10.00	12.00	10.00	8.00	6.00	4.50
Ringed	10.00	12.00	10.00	8.00	6.00	4.50

## Best I. P. Cod or Blue-Fish Hooks—Tinned.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$10.00	12.00	10.00	8.00	6.00	4.50
Ringed	10.00	12.00	10.00	8.00	6.00	4.50

## Packed in boxes of 100 Hooks each.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$10.00	12.00	10.00	8.00	6.00	4.50
Ringed	10.00	12.00	10.00	8.00	6.00	4.50

## Best Kirby Sea Hooks—Japanned.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$10.00	12.00	10.00	8.00	6.00	4.50
Ringed	10.00	12.00	10.00	8.00	6.00	4.50

## Best Kirby Sea Hooks—Tinned.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$10.00	12.00	10.00	8.00	6.00	4.50
Ringed	10.00	12.00	10.00	8.00	6.00	4.50

## Packed in boxes of 1 gross each.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$10.00	12.00	10.00	8.00	6.00	4.50
Ringed	10.00	12.00	10.00	8.00	6.00	4.50

## Central Draft Hooks—Eyed and Flatted.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$10.00	12.00	10.00	8.00	6.00	4.50
Ringed	10.00	12.00	10.00	8.00	6.00	4.50

## Packed in boxes of 100 Hooks each.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$10.00	12.00	10.00	8.00	6.00	4.50
Ringed	10.00	12.00	10.00	8.00	6.00	4.50

## Best Drop-Point Mackerel Hooks.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$10.00	12.00	10.00	8.00	6.00	4.50
Ringed	10.00	12.00	10.00	8.00	6.00	4.50

## Best Cast-Steel Black-Fish Hooks.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$10.00	12.00	10.00	8.00	6.00	4.50
Ringed	10.00	12.00	10.00	8.00	6.00	4.50

## Packed in cartons of 10 boxes of 100 Hooks each, making a package of 1000 Hooks.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$10.00	12.00	10.00	8.00	6.00	4.50
Ringed	10.00	12.00	10.00	8.00	6.00	4.50

## Halibut, Ringed.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$10.00	12.00	10.00	8.00	6.00	4.50
Ringed	10.00	12.00	10.00	8.00	6.00	4.50

## Packed in cartons of 10 boxes of 100 Hooks each, making a package of 1000 Hooks.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$10.00	12.00	10.00	8.00	6.00	4.50
Ringed	10.00	12.00	10.00	8.00	6.00	4.50

## HEAVY POLISHED TIN-WARE, ETC.

CENTRAL STAMPING COMPANY'S LIST FOR MARCH 1, 1885.

## Batter Pails.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Coffee Pots.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Coffee Boilers.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Colanders, per doz.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Dippers.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Dinner Kettles, per doz.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Dish Kettles.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Funnels.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Farina Boilers.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Farina Sauce Pans.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Kerosene Cans.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Kettles, Milk.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Measures, with Patent Lips.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Measures, Graduated, Lipped, per doz.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Punch Kettles, Copper Bottom.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Pans, Dish.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Pans, Milk.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Pans, Deep Bread.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Pans, Square, Ringed.

Nos.	10-0	9-0	8-0	7-0	6-0	5-0
Flatted	\$8.50	7.00	6.00	4.50	3.50	3.00
Ringed	8.50	7.50	6.00	4.50	3.50	3.00

## Scoops.

Nos.	
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[illegible]



Parallel, Prentiss.....	dls 25 & 5
Parallel, Simpson's Adjustable.....	dls 40
Saw Filers, Bonney's, Nos. 2 & 3.....	Per doz \$15.00, dls 40
Saw Filers, Stearn's.....	dls 30 & 10
Saw Filers, Hopkins.....	Per doz \$17.50, dls 10
Saw Filers, Reading.....	dls 20 & 10
Saw Filers, Wentworth.....	dls 20 & 10
Covell Hand Vices.....	dls 20
Richardson's Vice and Anvil.....	dls 25
<b>Washer Cutters.</b>	
Smith's Patent.....	Per doz \$12.00, dls 30 & 10 & 10
Johnson's.....	Per doz \$11.00, dls 35 & 10
Penny's.....	Per doz Fol. #14; Jap'd, \$10, dls 55
Appleton's.....	Per doz \$10.00, dls 60 & 10
Bonney's.....	dls 30 & 10
<b>Washers.—See Nuts and Washers.</b>	
Well Wheels—8 in., \$1.85; 10 in., \$2.15; 12 in., Wire.....	
Brass and Copper, new list, Jan. 18, 1894.....	dls 30
Market, Bright and Annealed, Nos. 0 to 18.....	dls 70 & 5
Market, galvanized.....	dls 65 & 5
Market, Tinned, Tinned list.....	dls 60 & 5
Stone, Bright and Annealed Nos. 10 to 30.....	dls 70 & 5
Stone, Galvanized, Nos. 10 to 30.....	dls 55 & 5
Tinned Broom Wire.....	dls 60 & 5
Cast Steel Wire.....	dls 55 & 5
Stone, Bright and Annealed Nos. 10 to 30.....	dls 70 & 5
Annealed Grape, Nos. 8 to 14.....	dls 70 & 5
Fence Staples, galvanized.....	Per doz \$4.00, dls 40
Stubs' Steel Wire.....	\$1.00 to \$2.00 per lb
Barb Fence.....	See Trade Report
Rail Wire Safety Guards.....	Per 1000 \$10.00, dls 25
Wire on Hooks.....	dls 25
Steel Music Wire, Nos. 7 to 30.....	dls 55
Picture Wire.....	dls 60 & 10
Wire Clothes Lines, See Lines.....	
Wire Cloth, green, drab and black, 100 sq. ft. \$2.00 net up to 5 ft 6 in.	
<b>Wrenches.—American Adjustable.....</b>	
Baxter's.....	dls 45 & 5
Baxter's Diagonal.....	dls 35 & 10
Coe's Genuine.....	Cash in 10 days, dls 60 & 5
Coe's Mechanic.....	dls 60 & 10 & 10
Coe's Pattern, Malleable.....	dls 75 & 10 @ 75 & 10 & 5
Coe's Pattern, Wrought.....	dls 75 & 10 @ 75 & 10 & 5
Grant Agricultural.....	dls 75 & 10 @ 75 & 10 & 5
Bemis & Call's Patent Combination.....	dls 30 & 5
Bemis & Call's Merrick's Pattern.....	dls 35 & 5
Bemis & Call's Bridge's Pattern.....	dls 35 & 5
Bemis & Call's Cylinder or Gas Pipe.....	dls 40 & 5
Bemis & Call's No. 3 Pipe.....	dls 35 & 5
Aiken's Pocket (Bright).....	\$1.00, dls 50 & 10
The Favorite Pocket (Bright).....	Per doz \$4.00, dls 40
Weber's Patent Combination.....	dls 25
Horsman's.....	dls 25 & 10
"Always Ready".....	dls 25 & 10
Alligator.....	dls 40 & 10
Douche's Engineer.....	dls 25
<b>Wringers.</b>	
Novelty, for Common Tubs, No. 2, 10-Inch.....	\$30.00 Per doz.
Novelty, for Common Tubs, No. 3, 11-Inch.....	34.50
Excelsior, for Stationary Tubs, No. E, 10-Inch.....	30.00
Excelsior, for Stationary Tubs, No. F, 11-Inch.....	43.50
Excelsior, with Folding Bench, No. A, 10-Inch.....	48.00
Excelsior, with Folding Bench, No. B, 11-Inch.....	52.50
Universal, No. 2.....	30.00
Universal, No. 2.....	33.00
Universal, No. 1A.....	34.50
Universal, No. 1B.....	36.00
Universal, No. 1C.....	37.50
Universal, for Set Tubs, A 2 1/2.....	30.00
Universal, for Set Tubs, B 1 1/2.....	30.00
Universal, for Set Tubs, C L.....	66.00
Adams & Co. No. 8.....	30.00
Peerless No. 3.....	30.00
Peerless No. 3.....	34.50
No. 10 Improved 2 1/2.....	30.00
Metropolitan, "No. 2.....	30.00
Metropolitan, "No. 2 1/2.....	30.00
<b>Wrought Staves, Hooks, &amp;c.—See Hooks.</b>	
<b>S. H. &amp; E. Y. MOORE,</b>	
163 & 165 Lake St., Chicago,	
<b>HEAVY HARDWARE</b>	
<b>AND</b>	
<b>Railroad Supplies.</b>	
MANUFACTURERS OF	
"CLIMAX" BARN DOOR HANGERS,	
"ZENITH" BARN DOOR HANGERS,	
For Wood Track,	
MOORE'S FREIGHT CAR DOOR HANGERS	
BAGGAGE CAR DOOR HANGERS,	
RAILROAD HANGERS,	
PARLOR DOOR HANGERS,	
Send for New Price Lists.	
EASTERN AGENTS:	
<b>H. B. NEWHALL CO.</b>	
105 Chambers St., New York.      47 Pearl St., Boston.	
<b>ARMSTRONG'S</b>	
Improve Water, Gas and Steam-Fitters'	
<b>TOOLS.</b>	
	
<b>Adjustable Stock and Dies for Pipe, Bolts and Brass Tubing.</b>	
Tapped to Standard Gauges. Adjustable to all variations in the size of fittings. Can be resharpened without drawing the temper, by simply grinding. Possessing practical advantages appreciated by all mechanics. Circular sent free on application.	
Manufactured by <b>F. ARMSTRONG, Bridgeport, Conn.</b>	
<b>Engineering Materials.</b>	
Incorporated 1881. THE Largest Manufacturers IN THE WORLD OF	
Nickel Anodes, Nickel Salts, Patent Muslin Buffs, Polishing Lathes, Polishing Felt, Polishing Compositions, Walrus Leather, Wood Emery Wheels Platers' Brushes, &c., &c., &c.	
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## Custom-House Irregularities.

President Arthur's term of office closed with an investigation in progress directed at certain practices long tolerated in the New York Custom House, prejudicial alike to the interests of the mercantile classes and to the Treasury. If there were attempts to defraud the revenue by systematic undervaluation, it was no less evident that subordinate officers were in guilty connivance. Moreover, in not a few instances there was reason to believe that merchants deservedly above suspicion were the victims, though in this last respect to an extent far less grievous than in some former years. It was hardly expected, however, that an investigation of the subject would so quickly result in several indictments of special agents by the Grand Jury, and the summary removal of officers of the Treasury, principally those upon the "fraud roll." Immediately following the installation of the new Administration was a circular issued by Secretary Manning to all customs officers, quoting and calling attention to Sections 5444, 5445, 5450, 5451 and 5452 of the Revised Statutes, which prescribed penalties for frauds which affect the customs service. The specific offenses named in the sections quoted are admitting merchandise to entry for less than legal duty, entry by false samples, bribery of a Member of Congress, bribery of any United States officer, and offering presents to revenue officers. When it shall appear that an offense against these statutory laws has been committed, the facts are to be immediately reported to the United States District-Attorney for proper judicial proceedings. Not yet satisfied, the Secretary of the Treasury issued an order to Collector Robertson, clearly intimating that the heads of departments would be held directly responsible for the performance of their duties, without the interposition of special agents, as follows:

"Sir: My attention has been called to the investigations into the conduct of the public business of the customs officers at the port of New York, which are now being prosecuted by special agents of the Treasury under the special directions heretofore given by this department. I am not prepared at this moment to entirely arrest those investigations, which were in progress when I became the head of this department, but I desire to say that they should be conducted under the general supervision of yourself as the chief officer of the port. The collector, naval officer, surveyor and appraiser are officers nominated by the President and confirmed by the Senate. The duties of those officers are clearly defined by the statutes and general regulations of this department, and in the performance of those duties those officers are not to be controlled or relieved of any responsibility by the special agents of the Treasury. The Appraiser's Department will be held to strict responsibility under the law for the proper classification and for a correct ascertainment and report to you of the dutiable value of imported merchandise, and as well the collector, naval officer and surveyor for the proper execution by each of all the laws which have been enacted by Congress to govern their respective departments. I deem it proper, however, to add that I shall expect the collector, as the chief officer at the port of New York, to take all convenient and proper care that the laws regulating the collection of the customs revenue at that port are faithfully executed by each and all of the several officers."

We may assume that the foregoing was called out through a conviction that the merchants of our importing cities, particularly New York, were not fully assured of the good faith of certain special agents at work for the detection of frauds. There was a suspicion that the cry of "Stop thief" which was directed against importers with increasing vehemence was really a feint to divert attention from another quarter. Indeed, there was a demand that a commission of merchants, independent of all rings and combinations, should share in the investigation. The subject appears to have received that serious consideration which it deserved, and we have the result that the Secretary of the Treasury has appointed Assistant Secretaries Fairchild and Conn and Assistant Treasurer Graves a commission, with instructions "to make an examination of the Treasury Department, with special reference to the simplification and improvement of the methods of doing business, and to the reduction and rearrangement of the official and clerical force." They are further instructed as follows:

"You are also authorized to call before you and examine the officers, clerks and employees of the department, to call for such statements as may seem to you necessary, and to inspect personally the books, accounts and records. You will report to me from time to time your conclusions and recommendations. You will be provided with the clerical assistance required to enable you to prosecute your inquiries promptly and thoroughly. In any recommendations which you may make for the discharge of employees you will be guided solely by their fitness to perform the duties assigned them, having due regard to the provisions of Section 1754 of the Revised Statutes and of Section 3 of the act of August 15, 1876." The present status of the inquiry into custom-house management, it is needless to observe, is a source of profound satisfaction.

The plan to connect Paris and London with pneumatic tubes has been reported favorably by the French engineers and submitted to the Government. It is proposed that two pneumatic tubes be laid, following the line of the Northern Railroad from Paris to Calais, thence across the Channel to Dover, following the line of the Southeastern Railroad to London. Letters could be thus transmitted between the two capitals in one hour. Wagonettes like those now used to transport telegrams from Paris are to be used, weighing 10 kg. and capable of carrying 5 kg. weight of mail matter. Twenty pneumatic trains are to be started every hour. The total cost is estimated to be \$7,000,000. The total distance is 475 km.

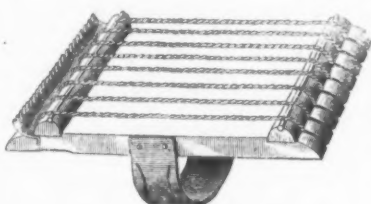
All the great copper firms of Swansea, including Williams, Foster & Co., Charles Lambert & Co. and Vivian & Sons, have adopted a process invented by William El-

more for the separation of gold and silver from copper. The copper wire for some of the recent Atlantic cables was made from copper refined by this process, and Williams, Foster & Co. are producing large quantities of chemically pure copper which has an electric conductivity equal to Matheson's standard.

## HARDWARE NOVELTIES.

## Wire Curry-Comb.

In the cut herewith given a Wire Curry-Comb is represented, made by the Muncie Novelty Company, Muncie, Ind., for whom Maltby, Curtiss & Co., 20 Warren street, New York, are agents. This curry-comb, which is called the "Jay Eye See," has been made for some time without the improvements which are indicated in the cut. One new feature which has been added is the insertion of a brush cleaning, galvanized tooth comb, as shown in the cut, in one end of the comb, for the purpose of cleaning the brush. Another modification is capping the end ridges over which the twisted wires are drawn with light steel rods for the purpose of keeping the wires in tension and preventing their sagging in use. These improvements add but little to the weight, a point in this curry-comb to which the manufacturers direct special attention. The advantage claimed for this article, in addition to those



The "Jay Eye See."

referred to, is the efficiency with which it is said to do its work, rubbing and cleaning without cutting or scratching the skin. Its utility for cleaning a horse covered with mud or sweat or when shedding his coat are especially alluded to.

## The Twisted-Wire Box Strap.

This very simple article, represented in the accompanying cut, is manufactured and put on the market by the Twisted-Wire Box Strap Company, 31 Leonard street, New York. The company was organized in June



Twisted-Wire Box Strap.

last, and the wire and the machines for making the same are patented. It will be seen that after each opening or hole left for the nails the strap is twisted in the reverse direction, for the purpose of preventing the strap from stretching and to make a satisfactory band. The manufacturers refer to its simplicity as being such that inexperienced hands can use it without difficulty, and call attention to the obvious advantage that there is no necessity, as in the case of iron bands, of punching holes, nor, as in the use of wooden hoops, of soaking in water. They also refer to its strength, especially as compared with wooden hoops, which are liable to break at the edge or corner of the case. For the convenience of the trade the straps are cut in lengths of 5, 6, 7, 8, 9, 10, 11, 12, and 14 feet, and put up 50 pairs in a bundle. The manufacturers also put up the strap in coils containing about 3000 feet. A light wire strap is also made, cut in lengths and put up in coils of about 5000 feet.

## The Huntington Pipe Wrench.

Graves & Moore, manufacturers' agents, 112 Chambers street, New York, are putting on the market the Huntington Pipe and Bolt Wrench. As will be seen by the cut, this wrench is so simple in construction that scarcely any description is necessary. The handle is a piece of pipe attached to the head by a coupling. The head—of cast-iron steel—is made in three parts. The jaw, which is a single piece, is pivoted on a bolt, as shown in the cut, and has shoulders at each side which prevent it from dropping back out of position. The jaw is made in two pieces, held together by the coupling and the bolt. The inside of the jaw is serrated, as is also the top of the jaw, between which the pipe or bolt is grasped. In use the jaw is first raised and the pipe placed in the opening, and on turning the wrench the jaw falls back and grips the pipe. It is claimed for this wrench that, since it grips on the principle of a wedge, it



Jewett's New Era Water Cooler.

with a galvanized-iron reservoir and galvanized-iron ice cylinder. These New Era Coolers of both grades are made in three



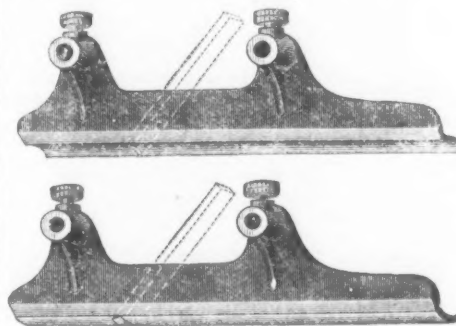
The Huntington Pipe Wrench.

will not split the pipe, and that by inserting the handle into a hole in the bench it can be employed as a pipe vise. Owing to the simplicity of its construction and the strength of the several parts, it is said to be exceptionally strong and durable. The Huntington wrench is made in three sizes, the smallest taking pipe from 1/4 to 1/2 inch and the largest from 1 1/4 to 2 1/2 inches in diameter.

## Hollows and Rounds.

Another combination has been added to No. 45 Beading, Rabbit and Slitting Plane, manufactured by the Stanley Rule and Level Company and illustrated in their advertisement on page 9 of this paper. This new feature, it is stated, has been added at the solicitation of woodworkers who have used the tool in its original form, and consists of sets of Hollows and Rounds, as shown in the accompanying illustrations. These addi-

tional parts, as will be seen by referring to the representation of the tool, can be attached to the arms of the stock, while the corresponding size and form of cutter is secured in the main stock. As all the parts of Plane No. 45 are made interchangeable, these hollows and rounds will fit any plane of that style. They are sold in pairs or singly, and are numbered like the ordinary



Attachment for Hollows and Rounds.

sizes of the wooden tools for the same purposes. A full description of these novel tools, with sizes, prices, &c., will be found in the Woodworkers' Companion, which will be mailed to dealers or mechanics on application to the manufacturers, Stanley Rule and Level Company, New Britain, Conn., and 29 Chambers street, this city.

## Jewett's New Era Water Cooler.

The accompanying illustration gives a sectional view of Jewett's Patent New Era Water Cooler, which is made by John C. Jewett & Sons, Buffalo, N. Y., under patent May 13, 1884. The water is cooled, it will be seen, with air being brought into contact with the ice, the ice being placed in a cylinder which is suspended from the cooler over, thus protecting the water from any impurities that may be contained in the ice. The reservoir is porcelain-lined, and the cylinder is made of copper, lined on the outside—that is, next to the water. In addition to the security thus obtained against the introduction of impurities into the water, the convenience of making the cylinder containing the ice a receptacle for bottles of wine or other articles is a feature to be noted by the manufacturers, as well as the utility of this contrivance as a suitable vessel in which to keep lemonade and other summer drinks. This article is made in three sizes: No. 593, with



Jewett's New Era Water Cooler.

with a galvanized-iron reservoir and galvanized-iron ice cylinder. These New Era Coolers of both grades are made in three

sizes, the extreme diameter of base measuring respectively 12 1/2, 15, and 16 1/2 inches.

## Packing-Box Strap.

The accompanying illustration presents a view of a Hardware Novelty which H. B.



A New Box Strap.

Scull & Co., Limited, of Pittsburgh, Pa., are just bringing out. It may be termed a Barbed Steel Strap, and will furnish the trade with a very convenient substitute for the light hoop iron which is now used to

strap up and strengthen packing boxes. The strap is rolled from soft steel, in continuous lengths, as long as possible, and is then passed through a machine which punches out the nail. This nail, as can be seen in the illustration, is of peculiar shape, being virtually a barb; and by reason of this shape, when once driven into wood, is held there firmly and cannot be pulled out. Thus in strapping a packing-box no nails are necessary; the strap is simply bent to the box and the barbs driven in with a few blows of a hammer. It is also intimated that this strap may be used by wagon manufacturers for strapping the tops of wagon-boxes, as by its use the box can be ironed in a few minutes without any waste of material.

## Improved Wrenches and Chain Tongs.

The Improved Combination Rouse Wrench, shown in Fig. 1, is made by the R. R. Rouse Mfg. Co., Indianapolis, Ind., New York office, 16 Cortlandt street. The wrench is made in four sizes, 6, 10, 12 and 15 inches respectively. The screw-rack is on a rabbit independent of the main bar, thus securing the entire strength of the steel. The rack, as may be seen in the cut, runs to the handle, allowing the wrench to open wider than in other constructions. The wrench is so made as to take all the strain directly on the main bar instead of on a supplemental jaw, and, the bar being of forged tool steel, it is

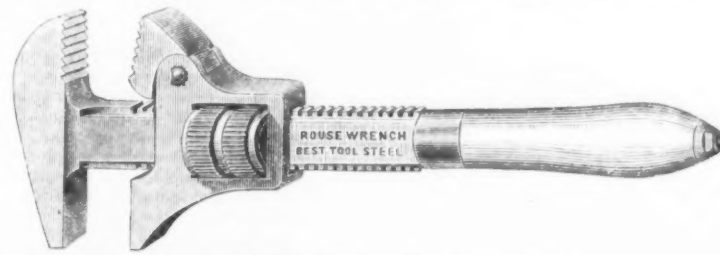


Fig. 1.—Improved Combination Rouse Wrench.

claimed that the wrench is unusually strong and durable. The makers recommend the 6-inch wrench to machinists, mechanics and gas fitters as being the size most convenient and best adapted to their needs. All the parts are made interchangeable, and can be renewed at any time. Another new tool made by this same company is their Improved Chain Tongs, a general view of which is shown in Fig. 2. As may be seen by the cut the wrench has a swivel or revolving collar with a chain attached to it, so that in whatever position the wrench is taken it is always ready for use, and there is no changing of bolts if one side gets dull. The head is a steel forging made without joints, thus

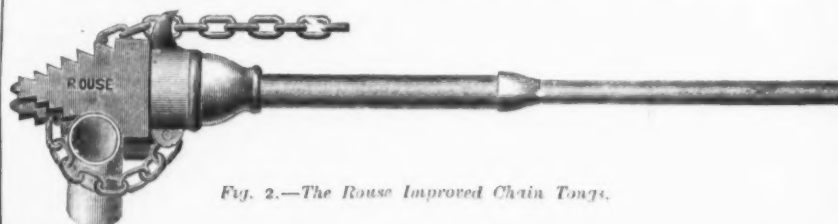


Fig. 2.—The Rouse Improved Chain Tongs.

giving a strong construction. The handle is so made that in case a longer leverage is wanted it can be unscrewed at the joint, and a piece of standard wrought-iron pipe put in, while in case work has to be done with the large tongs in a confined space the pipe may be dispensed with. The wrench can be taken apart to go into a tool-chest the same as stock and die handles.

## The Hocking Valley Strike.

A convention of delegates from the striking miners in Hocking Valley was held at Straitsville, Ohio, on the 18th inst., at which 50 cents per ton was accepted, thus ending one of the most ruinous strikes on record. Judge Burke, of the Hocking Valley Railroad, says the road has lost nearly \$1,000,000 and that the strikers lost fully \$1,500,000. Mr. H. D. Turner and Captain Doty gave a Pittsburgh reporter the following particulars: Trouble began on the 20th of June, 1884, by a refusal of the miners' union to conform to the exigencies of the times in regard to wages. In the territory mentioned are seven mining corporations, two of which were directly affected by the strike of 5000 miners when the two companies stated that 50 cents per ton was all that could be paid for mining coal. The scale fixed by the miners' union was 70 cents per ton of 2000 pounds in summer and 80 cents in winter. When the strike began, all work came to a standstill till August 1, when a gang of Italians were imported from Chicago, under guard, to take the place of the dissatisfied workmen. These foreigners were denominated as "black-legs," and subjected to all manner of annoyances. Later on 1500 more outsiders of all nationalities were sent in, including 500 negroes. Though the strike is now over and about 1000 strikers have returned to the pits, an armed guard has to be maintained by the companies where the trouble occurred, for fear of additional outrages being perpetrated. During the summer subscriptions were sent to the strikers from England, the Pacific Coast and elsewhere, even the cow-

miners' union undertaking to regulate wages, some firms cannot afford to pay as much for working a 10-foot vein as a 3-foot one. An industrious man ought to be able to mine from 4 to 5 tons of coal per day. At 50 cents per ton, the average wages are from \$2.35 to \$2.85, 15 cents paying for what oil and powder the miner uses. Mr. Turner further remarked that his firm could now procure more men than they had occasion to use.

## The Soudan Pipe Line.

At the last meeting of the Engineers' Club, of Philadelphia, Mr. Howard Constable described the pipe line or system of water-works which is to supply water along the route between Suakim on the Red Sea and Berber on the Nile. This will enable General Graham's army to make the journey across the desert country to join Lord Wolseley and also enable the railway to be constructed between Suakim and Berber, which latter point General Wolseley seems desirous of making the new base of operations. The water-works between Cairo and Berber are 1200 miles, and by no means an easy or rapid line of communication, as we have all been made aware. The route from Suakim to Berber is only 260 miles, but the country is rough and broken, and entirely destitute of water. The War Office, after long consideration and consultation, sanctioned the plan of laying pipes the whole distance and establishing pumping stations where necessary. There are to be two lines of 4-inch pipe, two pumping engines at each station, 25 to 30 miles apart, and each station will be made a

military post. The distance between the stations will vary considerably, according to the profile of the line and the best sites for military posts. There are no high mountains, and the resistance to be overcome by the pumps is principally that due to friction in the pipes. In most cases this will be about 1000 pounds per square inch. While we have pumped oil unbroken over 100 miles, a shorter distance is better adapted to making the best combination of the various conditions that must be considered. The quantity of water is about 150 to 200 gallons per minute, equivalent to 216,000 gallons a day. The engines will be of the Worthington duplex form used in the water-works of this coun-

try. At least one pump a week will be shipped. Several have already gone.

The pipe will be of wrought iron, 4 inches in diameter, reinforced at the ends with long screw-threads. They will be joined by long wrought iron screw-leaves. The pipe will be buried, and any tampering with it will be known at the pumping station by decreased pressure. The order for pipe will amount to \$750,000, and may possibly be placed in this country, as our English engineers have had little experience in this class of pipe, and are not so well prepared as our manufacturers with machinery for the special connections. About 20 miles a day are required, the whole amount needed being about 560 miles. From the oil belt in Pennsylvania, northeast, radiating from Pittsburgh, there are miles of oil-pipe, a line of which is carried to New York 8 feet under the river. The Waters-Pierce Oil Company have 2 miles of pipe across the Mississippi to St. Louis. So it will be seen that the project of pipe-laying in the Soudan presents no insurmountable difficulties.

S. H. Lockett, a visiting engineer, was introduced at the conclusion of the reading. He said he was of a party of American officers in the service of the Khedive in Egypt in 1874-76, and was chief engineer of the topographical survey of that ruler. He was familiar with the country through which the pipe line is projected and did not doubt its successful construction was assured. He had not the slightest doubt but that the railroad projected could be built, as there were none of those impassable obstructions to such work as were often spoken of. The pipe line would aid such construction and be absolutely necessary to its maintenance. The climate was no bar to its settlement, for, not considering the lack of water, there were no features of the climate against which objection could be brought. To obviate the lack of water the expeditions of topographical survey with which he was connected made drive wells from which good, constant supplies of water were obtained. They thought of many expedients, and this seemed the best. They never thought of the pipe line, which seemed to him even better.

**A New Rubber Belting.**—The New York Belting and Packing Company are about to introduce a new rubber belt called the "Saturn" brand. Its peculiarity consists in being circular woven, and, therefore, without any rough edges, seams or joints, thus preventing ripping or separating. A great many excellent features are claimed for this belt by the manufacturers.

The new Parliament buildings to be erected in Toronto will cost \$750,000. A number of designs from architects and builders have been received.



## INDUSTRIAL ITEMS.

## MASSACHUSETTS.

Rawson & Morrison, Cambridgeport, are building a second one of Rawson's patent jacket pan fertilizer dryers for Jno. P. Squire & Co. for use in their extensive packing establishment at East Cambridge. The machine is 80 feet long, 4 feet high, 3 feet wide and has a capacity of 1 ton of thoroughly dried material per hour. The cost will be about \$7000.

## PENNSYLVANIA.

The Baldwin Locomotive Works of Burnham, Parry, Williams & Co., Philadelphia, have just completed one of the largest locomotives ever built. It has been built upon an order of the Dom Pedro II Railway, of Brazil, and will be used in hauling freight trains. It is of the type designated by the Baldwin Works as the "Decapod" type, having five pairs of driving-wheels and a leading pony truck, or, in other words, it is a Consolidation locomotive with an extra pair of driving-wheels. The weight of the engine and tender, when in working order, will be about 112 tons, the actual weight on the driving-wheels being 64 tons. The driving-wheels are 45 inches in diameter and the length of the driving-wheel base is nearly 17 feet. The cylinders measure 22 x 26 inches, and the heating surface of the boiler tubes 1810 square feet. This immense locomotive will, it is estimated, be able to draw a load of 500 gross tons up a straight grade of 2 per cent., or 105.6 feet to the mile.

A charter for the Kemble Iron Company, with \$100,000 capital, has been filed. This is the reorganized company who will operate the Kemble Furnaces at Riddlesburg, Bedford County.

Springfield Furnace, at Williamsburg, Blair County, has been blown out and shut down for good, an event the probability of which was referred to recently in these columns.

At meeting of the New Castle Board of Trade last week two letters were received from Pittsburgh capitalists inquiring as to the facilities and advantages of New Castle for the location of a steel-wire nail works, and a works for the manufacture of steel-edged tools. The communications were referred to the Committee on Manufactures, and correspondence will be opened at once.

The nail factory, nail-plate mill and Hope Mill of the Pittstown Iron Company shut down on March 21 and will remain closed for a short time. They employ about 600 men. Lack of orders and want of storage room is the cause.

The Chestnut Hill Iron Ore Company, of Columbia, have sold their Shawnee Rolling Mill to Messrs. John Q. Denney, of Harrisburg, John Keller of Lancaster, and Michael Schall, of York. It will be remodeled by them and will probably be run on skelp and merchant iron.

The Scottdale Rolling Mill of W. H. Everson & Co. has started up again, satisfactory arrangements having been made with the employees in the matter of wages.

Operations at the Huntingdon Car Works have been suspended, throwing out of employment a large number of men. Blaine Bros., the proprietors, have been filling a contract for a Florida railroad, doing the woodwork at Ellaville, that State, and making the castings and other ironwork here. The contract has been completed. They hope to obtain others, so that the suspension may be temporary.

The foundry and machine shop of Benjamin H. Summers, at Petersburg, Huntingdon County, with all its contents, consisting of tools, stock, machinery and manufactured articles, was totally destroyed by fire on March 17. The loss has not been ascertained, but is heavy.

Speaking of the recent purchase of Robeson Furnace by the Robeson Iron Company, the *Lebanon Courier* says: "The great value of this estate is its furnace right in the Cornwall ore hills. It can take, without further cost than that of mining, all the ore that one furnace can work up, and, under the production that modern furnace practice has reached, that is a very large quantity. Furnaces in our valley now make as much as 100 tons of iron per day. This would require 200 tons of ore. The ore is worth at least \$2 per ton at the hills. Consequently, under this calculation, the furnace right represents a possible value of \$400 per day. The recognized value of this estate has greatly increased within the life of the present generation. Gov. David R. Porter bought it about 40 years ago for something like \$40,000. Henry P. Robeson subsequently bought it for about the same sum. Its estimated value now is about \$1,000,000."

The Danville Stove Works, employing about 70 men, have ordered a reduction of 10 per cent. in wages. The men held a meeting and decided to accept the reduction on the condition that if certain other shops received an advance they should be treated in like fashion.

A new co-operative concern is to start soon in New Brighton. A company of workmen, numbering 75 men, have purchased a building there and are placing in it the machinery necessary for operating a wire mill. The capital stock of the corporation is \$50,000.

## PITTSBURGH AND VICINITY.

The Union Pacific Railway Company have given the Westinghouse Air Brake Company directions to complete the order for brakes for their entire freight equipment at the rate of 15 sets per day. The number of sets yet to be shipped is 9500. When this road is fitted all the transcontinental lines will be using this brake on their freight cars.

## OHIO.

Negotiations are still pending in the matter of the sale of the Hanging Rock Foundry to the Mosler Safe and Lock Company, of Cincinnati, although it is pretty certain that the firm will purchase the plant.

The Cleveland Co-operative Stove Company have been running full time since March 1, employing their usual force of

80 molders and 70 other hands. This firm commenced operations on February 1 this year, although they do not usually start until March 1.

The Ironton Hoe and Tool Works have been running steadily since January 17 and are not accumulating any stock.

The rumor that the Thomas Furnace, at Niles, is to be started is without foundation. This furnace, which has been idle for over a year, was last operated by the Arnold Furnace Company.

A score or more of gentlemen representing about 90 per cent. of the unsecured liabilities of W. H. McCurdy & Co. met at the office of the firm in Cleveland, March 17, to take action regarding the firm's suspension. President Coit, of the Reading Iron Company, was made chairman of the meeting. A statement was presented showing the firm's assets to be about \$110,000, and the amount of liabilities to secured creditors \$36,000, and unsecured \$76,000. Mr. McCurdy, through his attorneys, made a proposal to the creditors to take his entire property as a liquidation of his indebtedness. The proposition was accepted with little debate, and a committee consisting of President Coit, G. M. W. Cauley, of Harrisburg, and James McCutcheon, of Pittsburgh, were appointed to take charge of his affairs. The committee were to have held a meeting on the 18th inst., and appoint a trustee who would assume immediate control of affairs and arrange minor details of the transfer.

The forge department of the mills of the Spaulding Iron Company, at Brilliant, has been compelled to shut down, owing to a strike among their miners.

## ILLINOIS.

The Peru City Plow Works, of Peru, have recently put in a special \$1200 machine for making their new metal wheel, of which they sold about 10,000 last year. The pressure of orders for their wheel and their other agricultural implements is such that they have been for some time running full force 14 hours a day.

Seven carloads of iron and cement for the Chicago Safe and Lock Company arrived on March 16, and the company are hard at work on orders.

The Calumet Iron and Steel Company's works at Cummings are now in full running order. The puddling and plate mills started up on March 12, and the rail mill on March 16.

Charles F. Elmes, of Chicago, is busy on orders for a dozen dynamos for the Bain Electric Light Company, of that city, for 15 Harrison coal-mining machines, and on general repair-work.

The Crane Bros. Mfg. Co., of Chicago, are adding to their elevators several new attachments, one of which is a device for handling the elevator. This consists of a lever resembling in its arrangement, shape and functions the reverse-bar of a locomotive. This lever is within the car and is moved to a central position when it is desired that the elevator remain stationary, and moved forward or backward according as it is intended to ascend or descend. The control is the same whatever the speed of the elevator. The company have orders on their books for a large number of elevators, and in their elevator department employ 200 men.

The smelting and refining works at Aurora are being enlarged.

## WEST VIRGINIA.

The Riverside Iron Works, of Wheeling, will soon remove their nail plate mill from Wheeling to Benwood, where their blast furnace and Bessemer works are located. Their nail factory, guide and bar mills will remain at Wheeling.

## MISSOURI.

The Western Forge and Tool Works, of St. Louis, a new corporation, are building new works, with a view to removal thereto shortly. The new corporation succeeded to the Western Steam Forge and Tool Works, of North Main street. The new works are of brick, one story high and 40 x 101 feet. It will be provided with a considerable quantity of new machinery—already contracted for in the East—for the manufacture of oil and artesian well drilling tools, and also a general line of such hardware tools as sledges, hammers, &c.

The St. Louis Ore and Steel Company held their annual election last week, and elected the following board of directors: Solon Humphreys, H. G. Marquand, C. K. Garrison, Le Grand B. Cannon, David Dows, Chester Griswold, Geo. B. De Forrest, R. S. Grant, E. A. Hitchcock, George Henry Warren, R. M. Olyphant, M. C. Wright Collier and Henry M. Olmstead.

The St. Louis Stamping Company are operating their granite iron rolling mills triple turn.

Owing to a freer influx of orders the Laclede Car Mfg. Co. have doubled their force, and expect to still further increase it. They have about 40 cars now under contract, and recently have provided themselves with a choice lot of lumber, of which 300,000 feet are strictly dry and in good condition for the season's work.

The Utilization of Coal Dust.—The Atomized Coal and Furnace Company, of New York, have issued a neat pamphlet devoted to descriptions of and general remarks on Whippley & Store's processes for the utilization of coal waste. These processes, which are now the property of the above company, aim at a satisfactory solution of the much-discussed problem of disposing of the large and steadily accumulating quantities of waste coal in a manner entailing a minimum of loss, and an examination of the pamphlet will prove interesting and instructive. Besides particulars relating to the machinery employed, we find remarks on requisites for complete combustion, the use of pulverized coal in generating steam, transmission of heat through boilers, &c. Reference is also made to the importance of the processes in the various departments of metallurgy.

## Introducing American Agricultural Implements into Europe.

During February of last year the Department of State sent a circular to the United States consuls in the several foreign countries, asking that they prepare reports on agricultural machinery in use in their districts, and suggest means for the enlargement of the foreign market for this class of American products. Vice-Consul Silcox, of Bremen, reports on this subject as follows: "It is a generally established fact that all our tools and smaller machines which are constructed of iron, steel, and wood combined have preference over those of all other countries; but of machines constructed of iron, such as engines and threshing machines, chaff-cutters, plows, cultivators, harrows, &c., preference seems to be given to the English and Continental makers.

"The finish may not be quite so elaborate as the American, but they are solid and adapted to the manner of tilling the soil over here. In order to establish a trade with any of the machines or implements the American makers must ascertain if they can supply at prices ruling the market delivered in Europe, and then make what slight changes are required.

"I did not pay much regard to what the American makers call 'competing with the cheap labor of Europe.' As a rule our workmen are more intelligent, and their habits are such that they will accomplish more per day than the European; so that there is here an equalizing principle. The facts are apparent that the manufacturer is not contented with the profits of the European. Wide difference exists in this respect, as the European makers do not expend the half that an American does in elaborate offices and buildings, yet they now have all the modern machinery to turn their work out upon an economical basis. Great advance has been made in Europe since the Vienna Exhibition, 1873.

"The most important work for the United States manufacturers desiring to make a trade in Europe is in securing ocean freights and studying the best manner in which they can pack their wares most compactly. All machines and implements should be shipped in a knocked-down form, and so packed, gaining every inch of space possible; marking the parts intelligibly, so that there will arise no difficulty in putting them together on their arrival at their destination. No case should exceed 1000 pounds in weight. All goods go by cubic measurement as soon as they reach the vessel, and 40 cubic feet constitute a ton. If they are implements, several should be cased together in one or more boxes, giving at same time net and gross weights of each package. This matter is one of the most important for manufacturers to study.

"The introduction and use of modern agricultural machines and implements on the Continent of Europe is scarcely 25 years old, the great supply coming mostly from England until about 15 years ago, when the United States made great strides with the introduction of mowing and reaping machines, followed with hay and manure forks, horse rakes, harrows, &c. Wonderful advances have taken place during the past 10 years through the demand by hundreds of manufacturers springing into existence into Germany, France, Sweden, &c.; but Germany probably has excelled in this respect all other countries on the Continent. The general demands are for the cheaper finished goods, and of that class in use about 30 or 40 years ago in the United States. It is a mistaken idea to think that the class of goods it has taken 30 or 40 years to educate our own people up to can be forced on the market in Europe at the high prices they are sold for at home. The steamer rates of freight are now so low that shipping by sailing vessel is altogether discarded, and with this quick transit it takes from four to nine months before the goods get into the consumers' hands."

The consul of Liège, Belgium, writes as follows: "Simple advertising, whether in pamphlet form or through the newspapers, is to little practical purpose. The European farmer is not a reading man. In order to be convinced, he must see, compare, touch and handle. Sample-rooms would offer him that opportunity, while, moreover, they would enable the consular officer to exhibit at fairs and expositions, and thus to secure to the American inventor the premiums and prizes that now go to the European imitator. The solidity and the superior finish of American agricultural implements and machinery at large are too glaring to be contested. Only as regards prices the imitator can hope to compete with any show of success. Led by this idea, I some time ago urged Consul Tanner to apply to the department for permission to open a sample-room here. Liège forms the center of a densely populated and prosperous part of the Kingdom; is situated on one of the great European trunk railroad lines; is approachable by canal and river,

and near the borders of Holland and Germany, in the latter of which two countries the establishment of American sample-rooms might not be regarded with a friendly eye. Not so in Belgium. Consul Tanner has been granted the permission asked for, but as yet has not availed himself of the privilege. If American manufacturers, without losing sight of the characteristic American finish, can in some time succeed in turning out agricultural implements and machinery at prices not ranging too far above those of imitations, they will easily crowd the latter off the market. I have arrived at this conviction after many years of close observation: A well-organized and properly-conducted sample-room at this point can contribute much toward paving the way for American products throughout a great portion of North-western Europe. The strides of American inventive genius are so rapid that the European imitator finds difficulty in keeping pace."

The Consul-General at Berlin, Germany, says: "I have seen no plow here that compares in skill of workmanship or beauty of finish with American plows. I might say the same in regard to the smaller kinds of farming implements made and used in Germany, such as forks, spades, hoes, axes, hand rakes, &c. I consider them much inferior to the American make, yet while this is so the people here are accustomed to the use of these tools, and, by reason of the very cheap labor here, they can be supplied at low prices, and the work of replacing them with foreign machinery, although of a superior quality, must be slow and require much labor. It can be done only by efforts of agents who are somewhat familiar with the habits, customs and wants of the people, and who can speak their language. The German people are naturally conservative, and are slow to adopt new ideas or new machinery without first seeing them illustrated and tried. I should say that, generally speaking, the best way to introduce agricultural machinery here of American make, or in fact for introducing goods of any description, would be for the merchants or manufacturers in America to form a business connection with some good, responsible man here, who has some knowledge of the trade sought to be engaged in, and who will take an interest in working up a business for his own benefit as well as for that of his associates in America. This seems to be the course taken by England and Germany, and the success they have met with should be instructive to our own people. I think there are many things manufactured and produced in America that would find a sale here if they could be brought to the attention of the people, but this can only be done by having some one who is personally interested make it his business to bring about such result."

In the Bulletin de la Société d'Encouragement pour l'Industrie Nationale, M. Carnot, in a report presented by him on behalf of the Committee of Chemical Arts, shows that the cause of the corrosion of sheet copper employed for the sheathing of ships is the presence of cuprous oxide, which, in contact with salt water, occasions the formation of soluble salts, even when the air is excluded. In order to reduce more completely the oxygen compounds present in the copper, he introduces a small quantity of metallic manganese, which completely reduces the cuprous oxide remaining in the metal, and becomes converted into a manganese silicate in contact with the sides and the sole of the furnace. If a few thousandths of the manganese remain alloyed with the copper, they affect neither its malleability nor its resistance to the action of sea-water. The manganese is introduced in the form of cupromanganese, an alloy containing 75 per cent. of copper and 25 of manganese.

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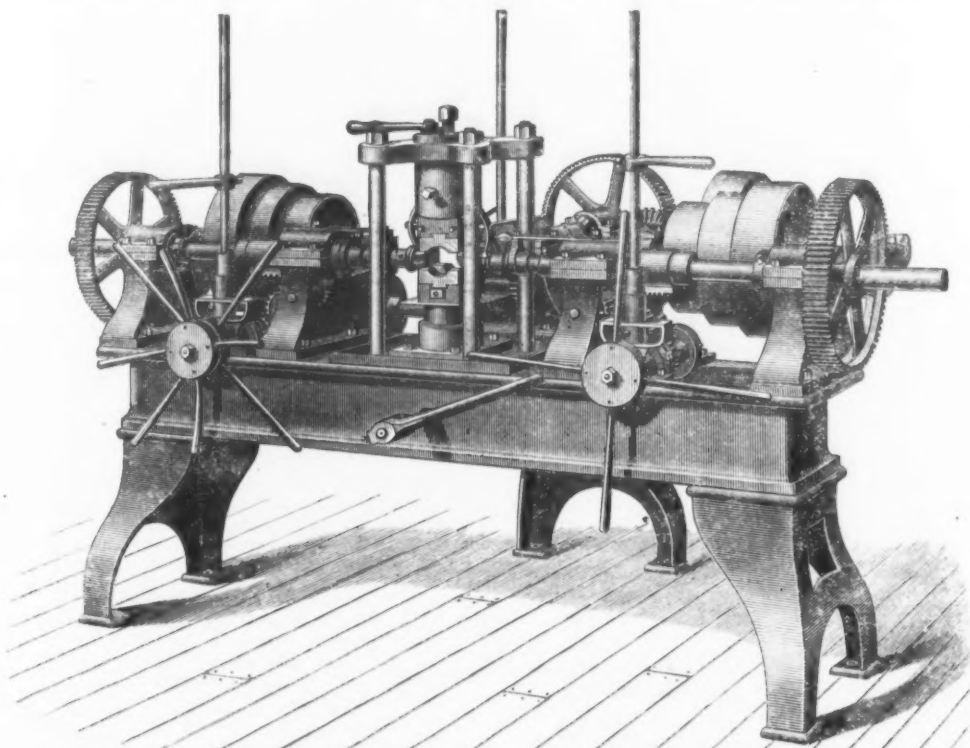
### Three-Way Tapping Machine.

Mr. E. J. Manville, builder of metal-working machinery, of Waterbury, Conn., has made improvements in his three-way tapping machine for tapping all kinds of pipe fittings ranging in size from the smallest fittings up to 4 inches inclusive. All the shafts of this machine, which is illustrated in the accompanying engraving, are made of steel, and all the gears are carefully cut. An important feature claimed for it by the manufacturer consists in the manner in which the fittings are held in the jaws while being tapped. They are held by means of a lever attached to a cam, which secures the fitting to be tapped and also allows it to be released instantaneously by a quick movement of the lever. When the taps have reached the required depth in the fitting they are made to reverse promptly by a simple automatic de-

(the weight of a cubic inch of iron). This will give the weight in pounds. We thus have  $40'' \times 30'' \times 2'' \times .26$  pound = 624 pounds, the weight of the plate. Again, what is the weight of a cast-iron plate 40 inches in diameter and 2 inches thick? Rule No. 2.—Multiply the square of the diameter by .7854 and this product by the thickness and .26 pound. Application.— $40'' \times .7854 \times 2'' \times .26$  = 653 pounds, the weight of the round plate. What is the weight of a cast-iron pipe 20 inches in diameter, 1 inch thick and 10 feet long? Rule No. 3.—To the inside diameter of the pipe add its thickness; multiply the sum by 3.1416 and this by the length, thickness and .26 pound. Application.— $20'' + 1'' \times 3.1416 \times 120' \times 1'' \times .26$  pound = 2058 pounds, the weight of the pipe. What is the weight of a cast-iron ball 12 inches in diameter? Rule No. 4.—Multiply the cube of the diameter by .5236 and .26 pound.

area of the ways and strengthening strip in center being 15 inches? There are 320 cores,  $1' \times 2' \times 3'$ , and three T-slot cores, each having an area of 3 inches by 20 feet long, to be subtracted from the above. According to the rule we have  $256' \times 48' \times 3' = 36,864'$  for bed plate, and  $256' \times 15' = 3840'$  for the ways, and  $36,864' + 3840' = 40,704'$ ; then  $1' \times 2' \times 3' \times 320 = 1920'$  for the 320 cores, and  $3 \times 3' \times 240' = 2160'$  for the slot cores, and  $2160' + 1920' = 4080' - 40,704' \times .26 = 9522$  pounds, which is the weight of the planer table. Two examples are given under this rule, to show the method of deducting cores.

To illustrate Rule No. 2 the roughing roll, as shown in Fig. 2, is selected. In taking the measurements of a roll one of the necks and wabblers may be omitted, considering the other end the same diameter as the body of the roll. This is usually a little on the



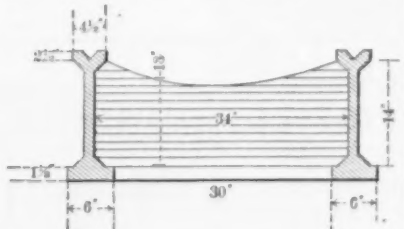
THREE-WAY TAPPING MACHINE, BUILT BY E. J. MANVILLE, WATERBURY, CONN.

vice in connection with the shipper rods which operate the overhead driving belts on tight and loose pulleys. The taps are each one drawn into the fitting by means of the lever-wheel, as shown in the cut, and are independent of each other, though all three can be started in together simultaneously. In connection with these machines automatic taps of all sizes from 2 inches inclusive will be furnished if desired. These taps render it unnecessary to reverse the machine, as they are so arranged that, when they have reached the required depth for which they have been properly adjusted, the cutters are instantly released from cutting by being drawn in, thereby causing the spindle to slide back by means of a weight, and in so doing they reset themselves, so that only a forward movement is necessary to bring them into the fitting. Owing to these improvements, it is claimed that nearly one-half of the time is saved over the old method. The machines are made in three sizes. No. 1 will tap all fittings up to 1 inch inclusive, No. 2 up to 2 inches inclusive and No. 3 up to 4 inches inclusive.

### On the Weights of Castings by Measurements.

The following article, by T. H. Radcliff, of Cincinnati, is taken from *Mechanics* for January:

While there are some men of long experience who can guess quite close to the quantity of iron it will take to pour a piece, it is



Weights of Castings by Measurement.—Fig. 1.—Diagram of Planer Bed.

guessing where a certainty is easily obtained. Pouring castings short is something that happens too often in many foundries; then there is excitement and confusion, with loud calls for more iron, and very often the iron arrives too late and the casting goes to the scrap heap. A casting that is poured short, unless very heavy, will invariably show cold checks, and when broken up the seam or cold check can be seen, where the hot iron has been poured on top of the cold and not united with it. The other extreme is where there is too much iron in the ladle, which, after pouring the casting, must be poured out in pigs upon the floor. I am aware that many text-books contain tables giving the weights of materials, yet in practice I have found it more of a problem to apply the tables than to measure the length, breadth and thickness of the pattern and find the weight by their use.

By the four following elementary rules the weight of almost any kind of shaped casting can be found. For example, what is the weight of a cast-iron plate 40 inches long, 30 inches wide and 2 inches thick. Rule No. 1.—Multiply the length, breadth and thickness together and the product by .26 pound

Thus  $12'' \times .5236 \times .26$  pound = 235 pounds, the weight of the ball.

I will give one or two examples as they occur in practice under each one of the above rules. In taking the measurement to find the weight of a complicated pattern it is often necessary to divide it up into several parts, and in nearly the same shapes as when put together by the pattern-maker. What is the weight of the planer bed shown in Fig. 1, the bed being 32 feet long, 3 feet wide, and of the dimensions as shown in the cut. The sectional area of one side contains the bottom flange,  $6'' \times 1\frac{1}{2}'' = 9'$ ; the web,  $14'' \times 1'' = 14'$ , and the ways,  $2\frac{1}{2}'' \times 4\frac{1}{2}'' = 11\frac{1}{4}''$ ; then  $9' + 14' + 11\frac{1}{4}' = 34\frac{1}{4}'$  which multiplied by 2 =  $68\frac{1}{2}'$  is the sectional area of both sides; then  $68.5' \times 384' \times .26$  = 6839 pounds, the weight of the sides. The bottom flange of the cross-brace contains  $4'' \times 1\frac{1}{2}'' \times 30' = 180$  cubic inches.

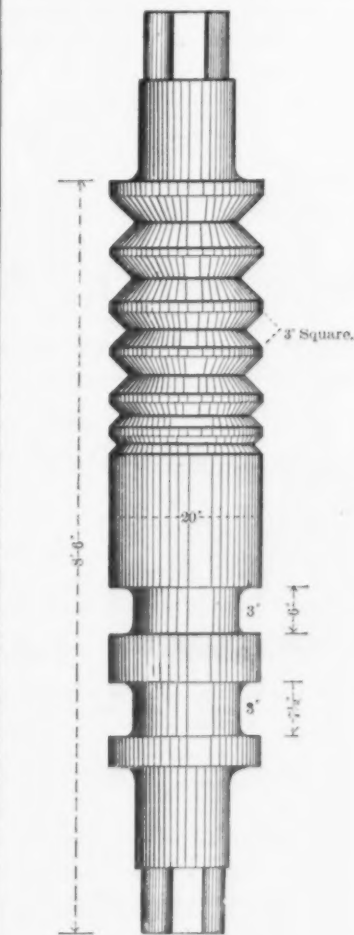


Fig. 2.—Roughing Roll.

The web, being  $13''$  high, contains  $34'' \times 13'' \times 1'' = 442'$ , and thus  $442 + 180 \times .26 = 161.72$  pounds, which is the weight of one brace, of which there are 17; then  $17 \times 161.72 = 2749.24$  pounds + 6839 pounds, the weight of sides, = 9588 pounds, which is the weight of the planer bed. What is the weight of a planer table 21 feet 4 inches long, 4 feet wide and 3 inches thick, the sectional

side of safety. Of course the weight of the necks can be found separately if it is preferred. The weight of a plain roll is first found and the grooves deducted. The length, omitting one neck, being 8 feet 6 inches by 20 inches in diameter, we have  $20'' \times .7854 \times 102' = 32,044.32'$ . From this there are to be deducted six grooves whose average is equal to one-half of a ring 3 inches square (see groove 3, Fig. 6); then  $20'' \times$

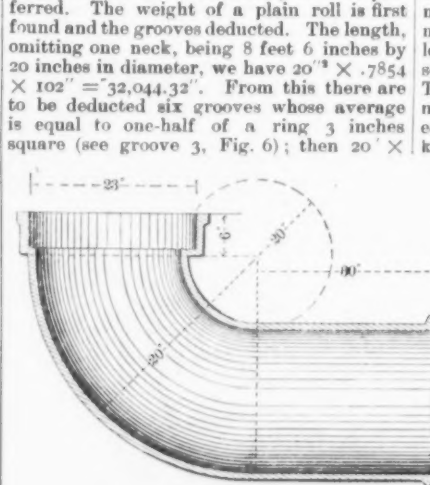
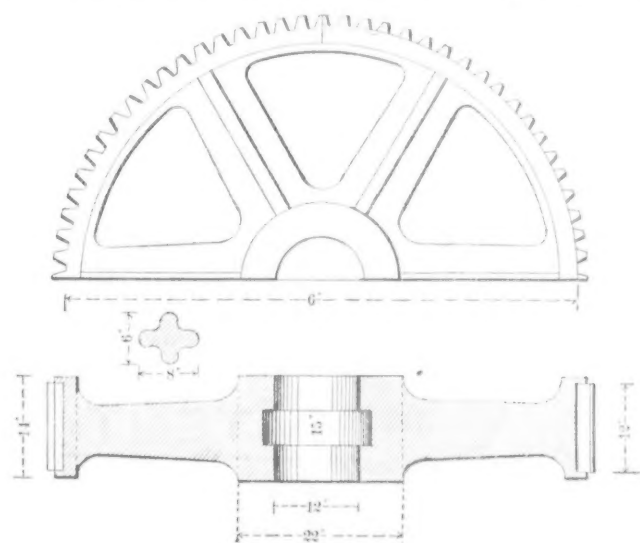


Fig. 3.—Hub and Spigot Ell.

$3.1416 \times 9' + 2 \times 6 = 1696.46'$  for the six V-grooves; there are also two square grooves whose average diameter is 17 inches, combined length  $13\frac{1}{2}''$  inches by 3 inches deep. Then  $17'' \times 3.1416 \times 13.5' \times 3' = 2162.99' + 1696.46' = 3859.45'$ ; then  $32,044.32' - 3859.45' \times .26 = 7328$  pounds, which is the weight of the roughing roll shown in Fig. 6. The hub and spigot ell, Fig. 3, and spur-gear, Figs. 4 and 5, are the examples for Rule No. 3. What is the weight of the ell, the inside diameter being 20 inches and thickness  $\frac{3}{4}''$  inch? The length of the bent part of the pipe, which is one-quarter of a circle, is found by adding the diameter of the pipe to the inside diameter of the ring, which in this case is 20 inches, and multiplying their sum by 3.1416; then  $20' + 20' \times 3.1416 + 4 = 31.66'$ , the length of one-quarter of the ring. The inside diameter of the pipe being  $20' + \frac{3}{4}''$ , the thickness, we have  $20.75' \times 3.1416 \times 31.66' \times .75' \times .26 = 402.39$  pounds for the weight of the bend. The spigot end being 30 inches long, we have  $20.75' \times 3.1416 \times 30' \times .75' \times .26 = 381.30$  pounds, the weight of the spigot. The inside diameter of the hub is 23', with an average thickness of  $1\frac{1}{4}''$  inches by 6 inches long; therefore,  $23' + 1.25' \times 3.1416 \times 6' + 1.25' \times .26 = 148.55$  pounds for the weight of the hub, and  $402.39' + 381.30' + 148.55' = 932$  pounds, which is the weight of the 20-inch ell. In making the measurements of the spur-gear, the rim arms and hub are made separately. The rim may be considered solid to the pitch line. If, however, greater accuracy is required, the rim and teeth may be found separately. The dimensions of this wheel are 6 feet in diameter to pitch line, 12 inches face, with 2 inches added to the face for the half-shrouding. The arms are  $8'' \times 6'' \times 2'$  the fillets in the corners being equal to the rounded edges. The hub is 22 inches diameter, 12 inches bore by 15 inches deep, the inside diameter of the rim being  $66'' + 3'$ , the thickness. We then have  $69' \times 3.1416 \times 14' \times 3' \times .26 = 2367.12$  pounds for the weight of the rim. The arms have a sectional area of  $24\frac{1}{2}'' \times 22''$  inches long; then  $24' \times 22' \times .26 \times 6' = 783.68$  pounds, the weight of the six arms. The bore of the hub being 12 x 5

inches thick, we have  $12' + 5' \times 3.1416 \times 15' \times 5' \times .26 = 1041.30$  for the weight of the hub, and  $2367.12 + 783.68 + 1041.30 = 4192$  pounds, which is the weight of the wheel. What is the weight of the still bottom (Fig. 6), the dimensions being 5 feet diameter by 5 feet deep, 2 inches thick at the bottom, tapering to 1 inch thick on the



Figs. 4 and 5.—Section and Elevation of Spur-Wheel.

top! The bottom of the still is one-half of a sphere, 64 inches outside diameter by 60 inches inside diameter. We therefore find the solid contents of the two half-spheres, 64 inches and 60 inches, and subtract the smaller from the greater, which will give the contents of the bottom. Then  $64'' \times .5236 \div 2 = 68,629.299'$  for the half-sphere 64' in diameter, and  $60'' \times .5236 \div 2 = 56,548.8'$  for the half-sphere 60' in diameter; then  $68,629.299' - 56,548.8' \times .26 = 3140.92$  pounds, the weight of the bottom part of the still. The weight of the top part is found by Rule No. 3. The inside diameter on the dotted line, Fig. 6, being  $61' + 1'$ , the thickness, we have  $62' \times 3.1416 \times 30' \times .26 = 1519.43$  pounds = the weight of the top. The inside diameter of the flange, exclusive of the thickness of still, being  $64' + 4'$ , the width of flange, we have  $64' + 4' \times 3.1416 \times 4' \times 1\frac{1}{2}' \times .26 = 333.26$  pounds, the weight of the flanges. The inside diameter of the outlet-pipe is  $4' + 2'$  thick; we thus have  $4' + 2' \times 3.1416 \times 28' \times 2' \times .26 = 274.45$  pounds for the weight of the pipe, and  $3140.92' + 333.26' + 274.45' + 1519.43' = 5268$  pounds, which is the weight of the still bottom.

It is sometimes required to know the area of an octagon or a polygon of any other number of sides. A simple rule easily remembered for this purpose is to multiply the length of a side by the radius of the inscribed circle, and divide the product by 2. This equals the area of one division, which, multiplied by the number of divisions equals the area of the polygon. After knowing the quantity of iron it will take

to pour a piece, the next thing necessary to know is the height the ladle will have to be filled to hold this amount. The rule for this is to divide the number of pounds of iron required in the ladle by the number of pounds the ladle will hold to the inch. Suppose the still bottom, Fig. 6, is to be poured with an 8000-pound ladle. It is customary to make ladles the same diameter as the height. Measure the diameter at one-half the depth, which for this case would be 34 inches; then by Rule No. 2,  $34'' \times .7854 \times 1' \times .26 = 236$  pounds, the number of pounds the ladle will hold to the inch. To the weight of the still bottom, 5268 pounds, must be added 500 pounds for the runner, gates, sinking head and waste; then  $5268 + 500 = 5768$  pounds required

in the ladle, and  $5768 \div 236 = 24.44'$ , which is the number of inches required in the ladle to pour the still bottom. In the planer bed the V-ways were purposely included, their area being equal to the area of the fillets on the V-ways and flanges. For the multiplier .5236 in Rule No. 4, .1365 is sometimes used. This saves multiplying by .26, the inches being converted into pounds by one operation, but, as the rule is often used to find the cubical contents of a ball or sphere, it was thought best to insert the rule as given.

**A 20-Ton Electric Crane.**—Electricity has recently been applied to the working of cranes, and the latest example is that of a foundry crane at the works of M. Farcot, at St. Ouen, France, the crane having previously been worked by hand. The generating dynamo is at a distance of about 100 yards from the crane. At the speed of 1550 revolutions per minute it produces a current of 13 amperes and about 350 volts. The secondary dynamo is fixed upon the crane itself, and makes 1000 revolutions per minute, developing about 4 horse-power. The crane gearing itself has not been altered, and the electric machinery has been added. A special rheostat allows progressively increasing resistances to be introduced up to 60 ohms, by means of which the lifting speed of the crane can be varied. A Mégy brake, acting by centrifugal force, assures safety in case of accidental derangement of the machinery. When drawing large castings out of the sand, a vacuum is produced under them at the moment they begin to be lifted, which may result in a very considerable increase

of the load by the atmospheric pressure acting on the surface of the casting. To prevent accidents from this cause or other overloading of the crane, an arrangement has been introduced by which the circuit is interrupted when the load exceeds the prescribed limit, and, of course, the crane comes to a standstill. The crane, which can lift

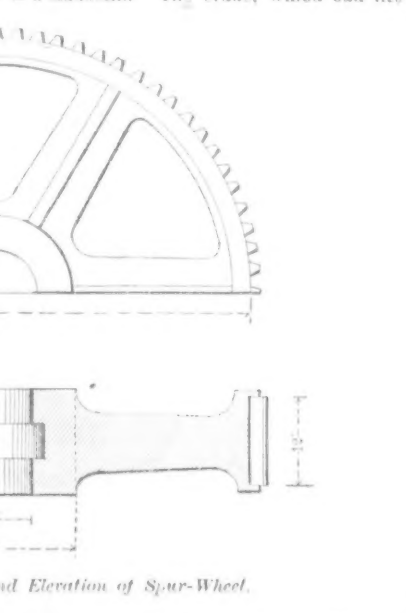
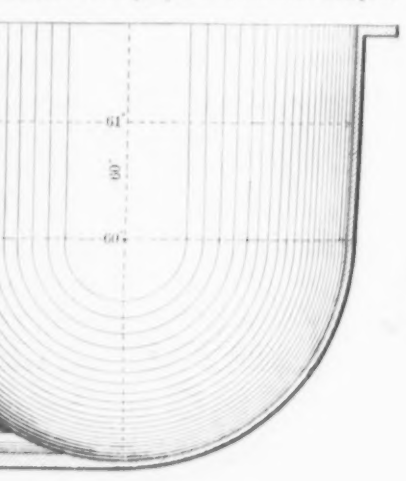


Fig. 6.—Section of Still Bottom.

20 tons, now requires only the attendance of one man, while formerly 10 laborers were required to work it.

**A Large Forging Press.**—Messrs. Charles Cammell & Co., Limited, of the Cyclops Works, have in course of construction an enormous forging press, which will have a power of between 4000 and 5000 tons. It will be served by two great cranes, each capable of lifting 150 tons. The castings and forgings are now in hand. They are being constructed entirely of steel manufactured by the firm. The press will be erected in a special building, which, with the furnaces, &c., will require over 1,000,000 of bricks. It is stated that this will be the largest and most complete forging press in the world. Messrs. Cammell & Co. have just forged at Grimesthorpe Steel Works, under their 30-ton hammer, what is believed to be the largest steel forging in one piece made in England up to the present time. It is a forging for the cylinder for a forging press, made to the order of Sir W. G. Armstrong, Mitchell & Co., of Elswick Works, Newcastle-on-Tyne. The weight of the ingot was upward of 43 tons, and the diameter about 60 inches. It was cast hollow and forged to a bottle-necked shape, the forging of which is 14 feet long, and the weight about 32 tons. The finished dimensions of the bore are about 3 feet. The Elswick firm have been in the habit of getting this class of work from Sheffield firms for many years, but it appears that they are now preparing to produce their own. Messrs. Thomas Firth & Sons, Limited, and Messrs. John Brown & Co., Limited, are also erecting forging presses, which are a new departure in the production of the large ingots for heavy ordnance.

**Bolckow, Vaughan & Co.**—The annual report of the directors of Bolckow, Vaughan & Co., Limited, states that the balance available for division as the result of the year's trading is £156,745, including the balance brought forward for the preceding year's accounts. A sum of £21,242 is required for debenture interest; the preference share dividend absorbs £22,923. A dividend on the ordinary shares at the rate of 2½ per cent. is recommended, which requires £68,657. Of the balance it is proposed to appropriate £40,245 to the reduction of capital account, leaving a balance of £3676. The capital of Bolckow, Vaughan & Co., Limited, is nearly £4,000,000, invested in coal, iron and salt mining, iron smelting, and steel and iron manufacture. The concern are the largest in the trade, and their management has a well-earned reputation for enterprise and ability. The smallness of the dividend is ample proof of the keen competi-



tion existing in the trade. During the past year the blast furnaces of the firm have been improved by the substitution of fire-brick instead of pipe hot air stoves, and the directors report satisfactory results. In the steel trade Bolckow, Vaughan & Co. until recently employed their works almost exclusively in rail manufacture, but during the past year they have gone extensively into the plate trade, and the results of this departure will be judged by the current year's trading.

A Canadian manufacturer says the new instructions to customs officials in the Dominion, intended to exclude all products of prison labor in the United States, will greatly encourage many local industries.



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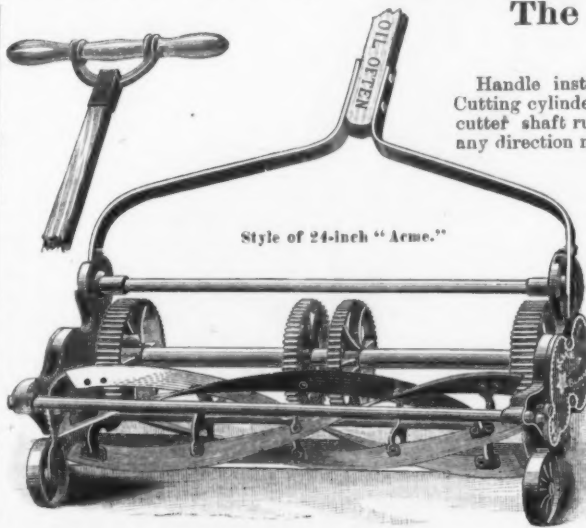
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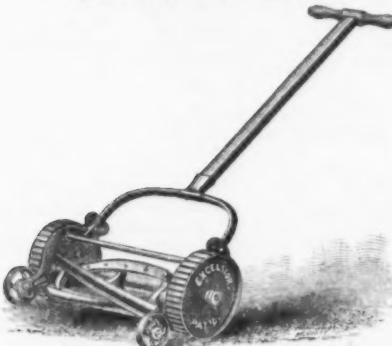
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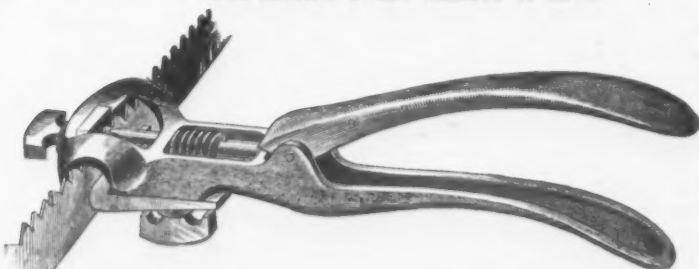
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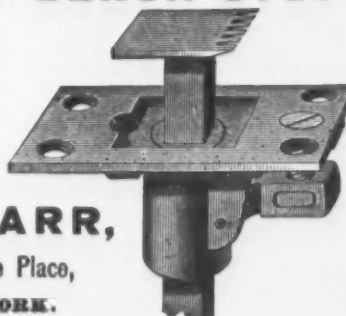
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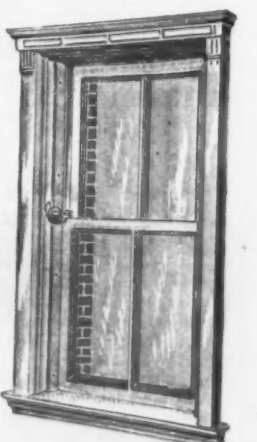
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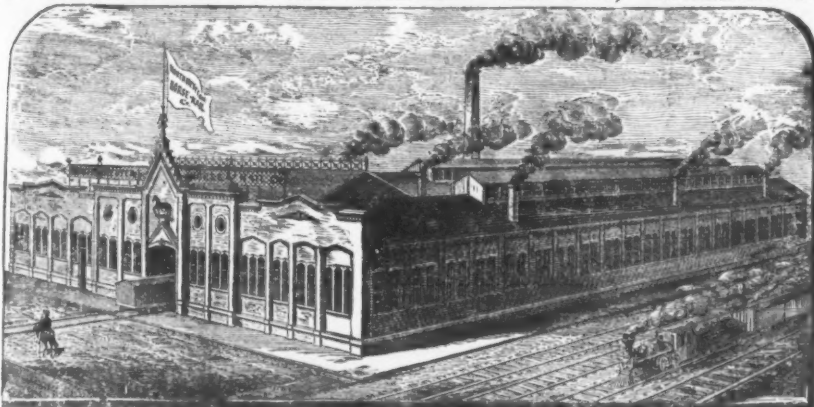
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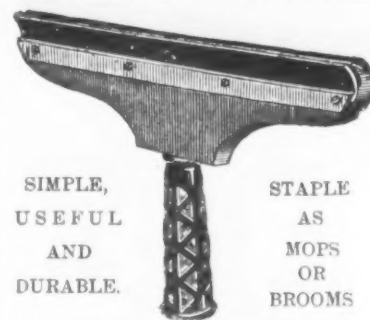
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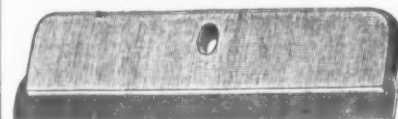


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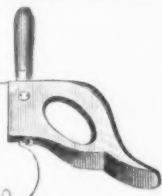
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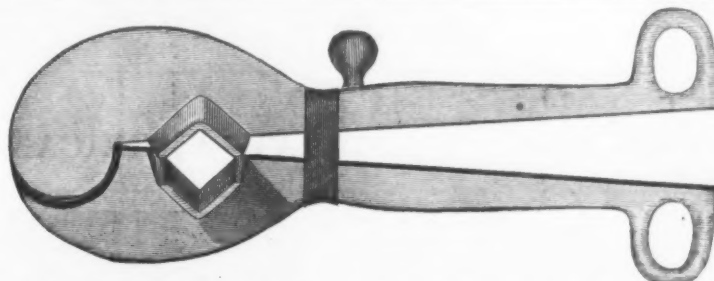


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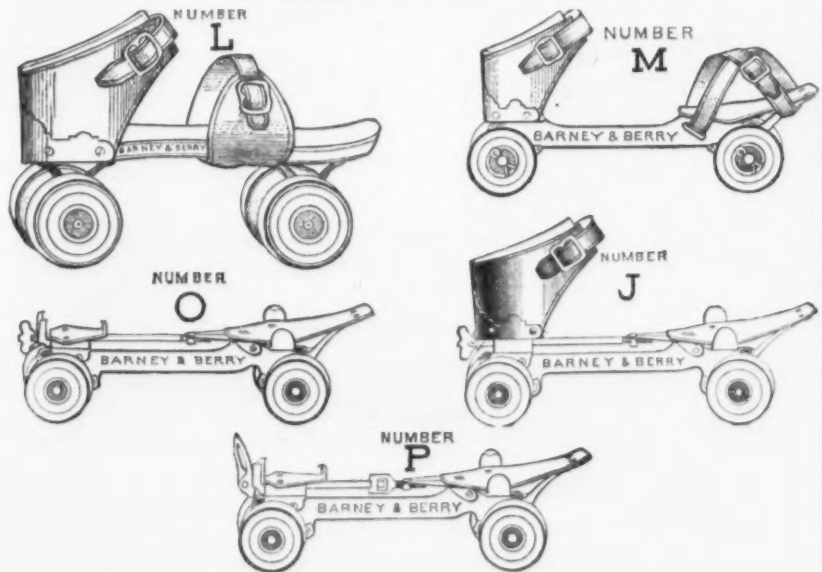
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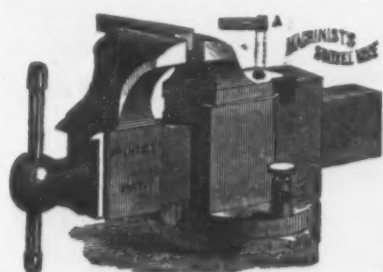
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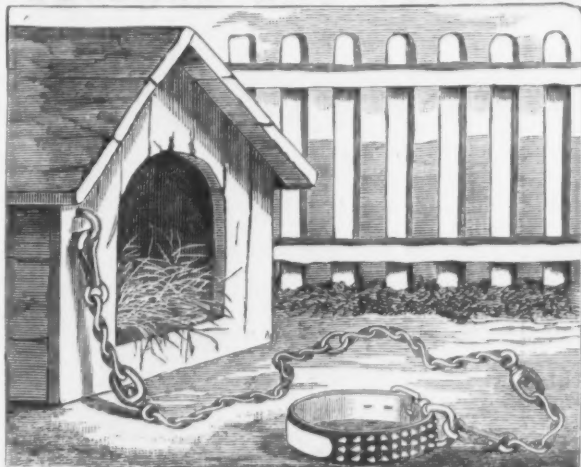
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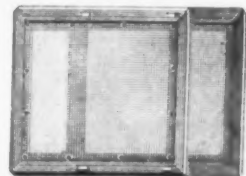
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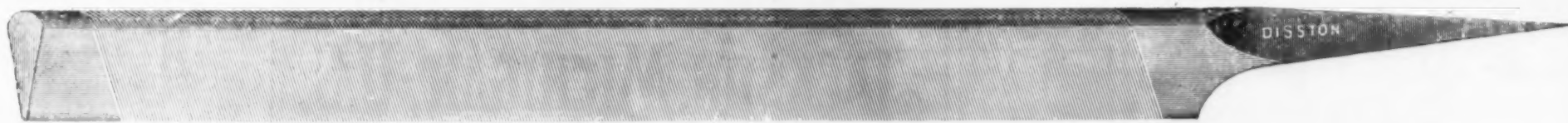
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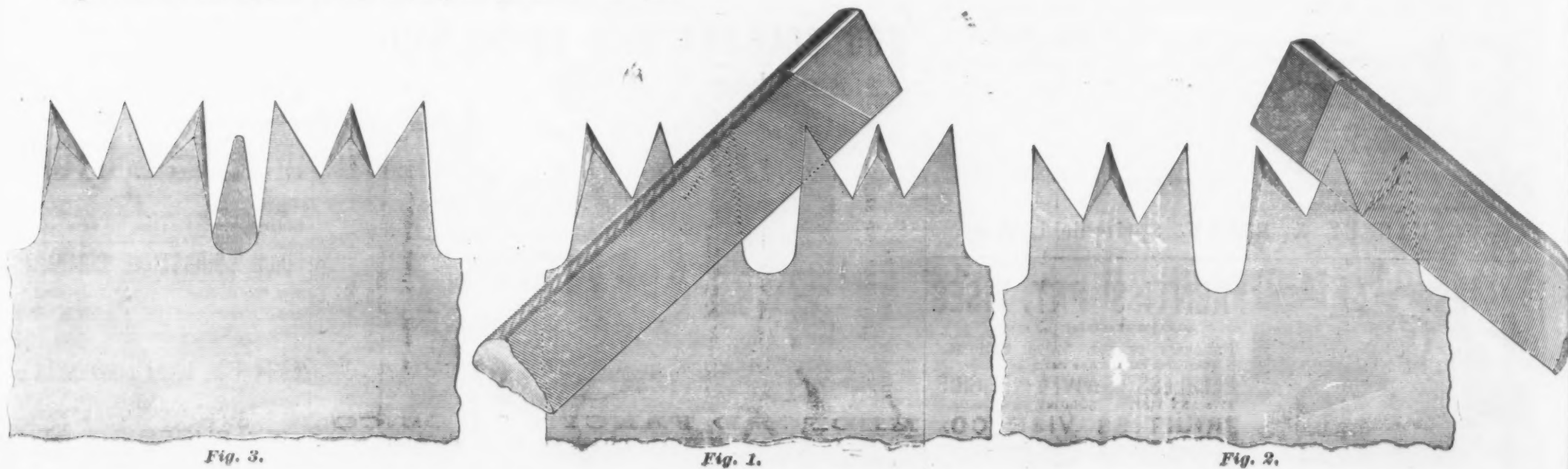


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Fig. 1 shows the manner of filing the long edge of the end tooth.

Fig. 2 shows the manner of filing the short or inside edge of the end tooth.

Fig. 3 shows the section of the file in the gullet of the saw.





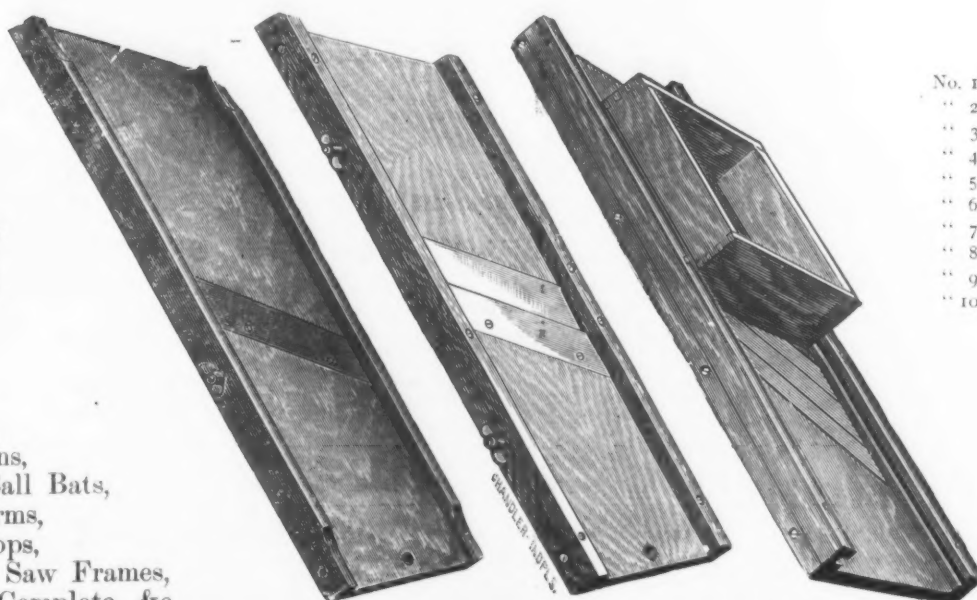
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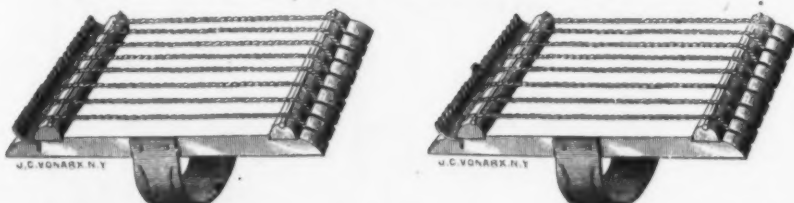
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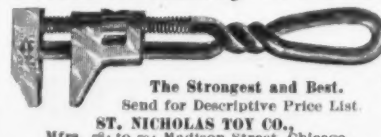
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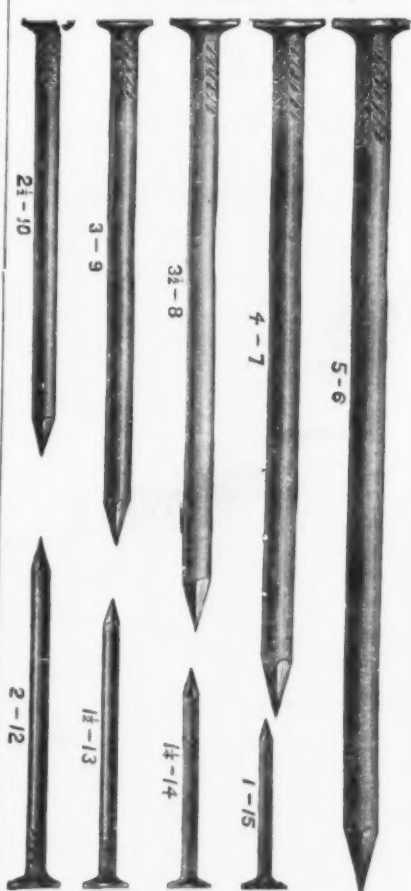
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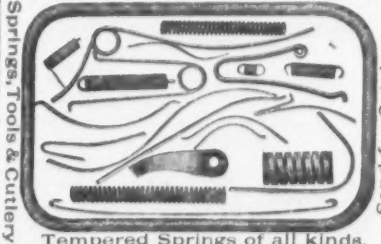
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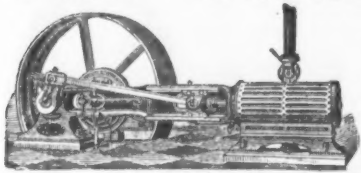


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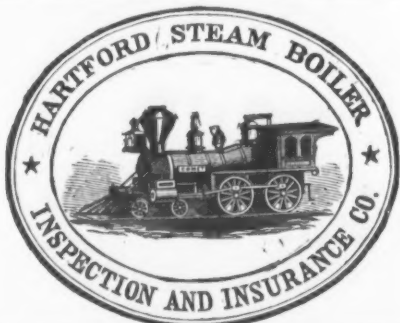


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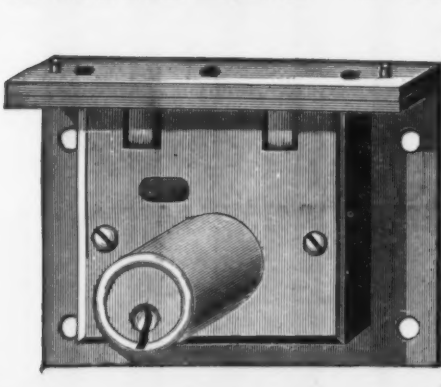
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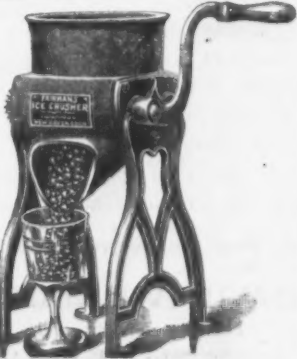
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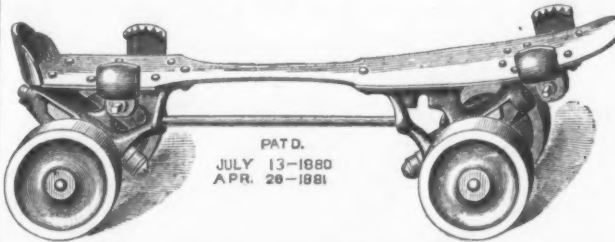
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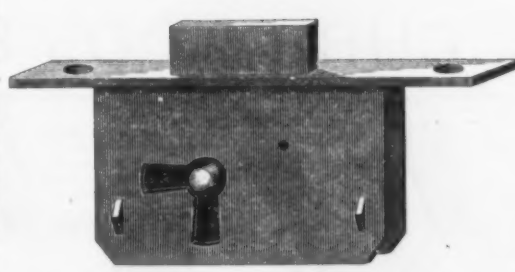
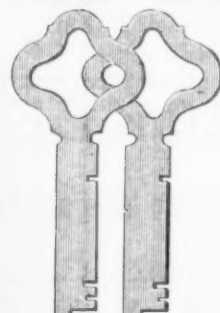
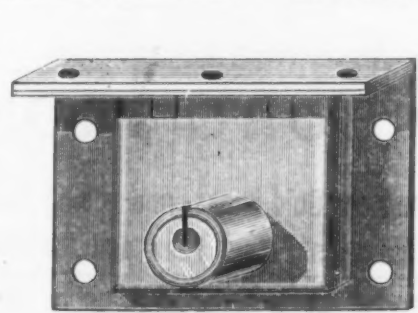
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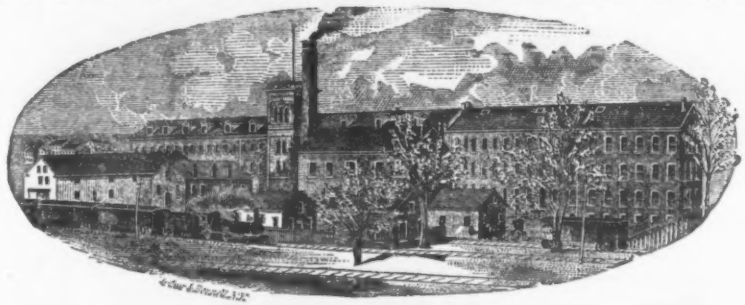
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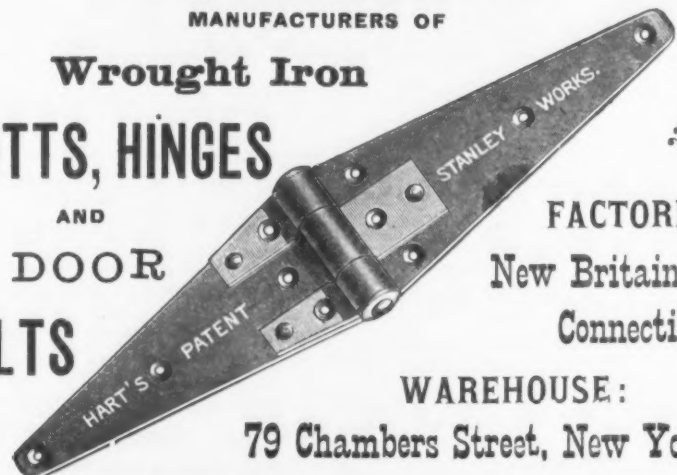


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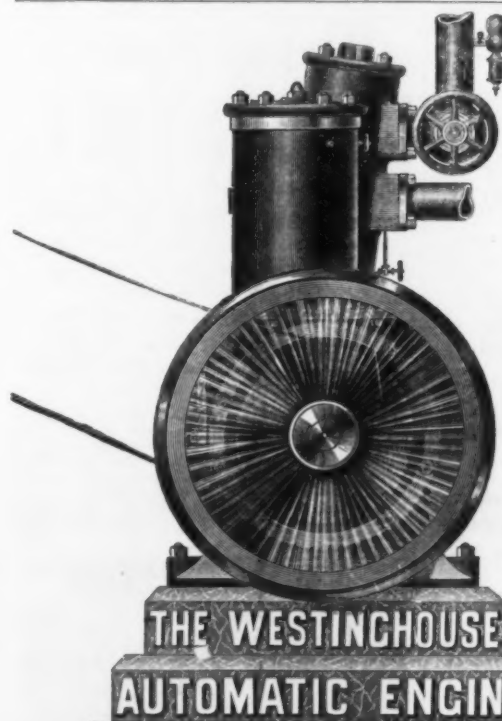
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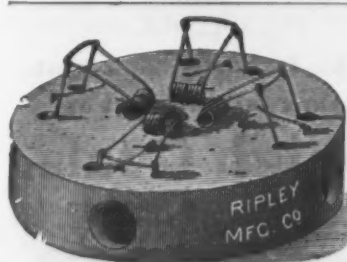
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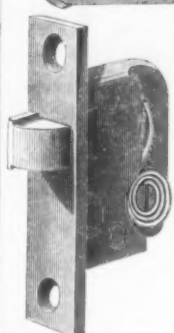
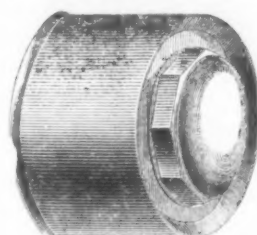
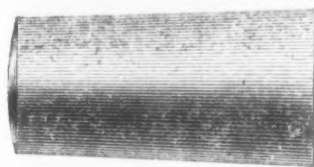
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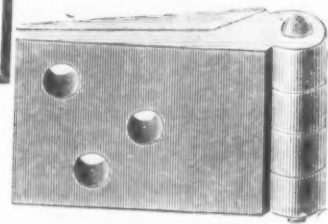
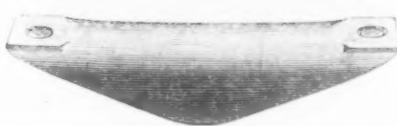
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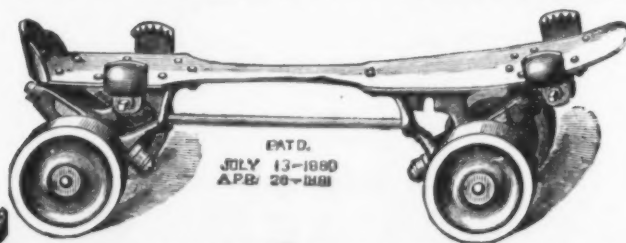
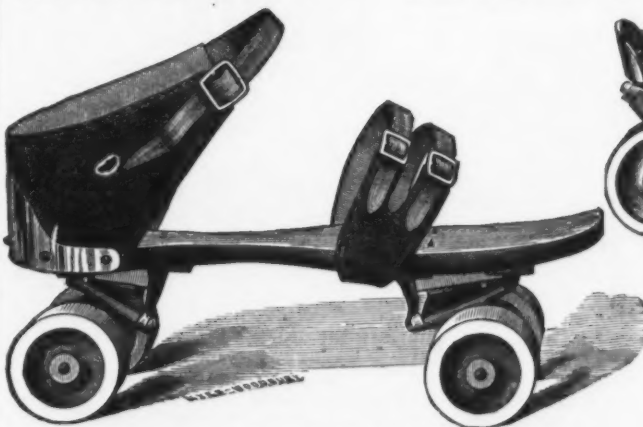
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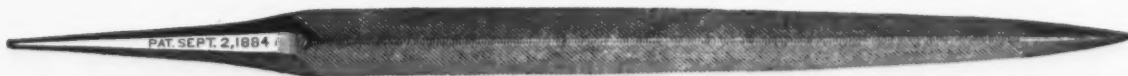
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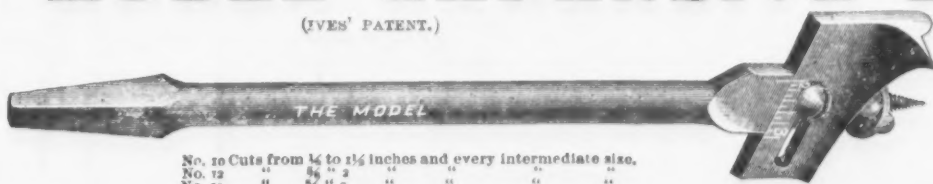


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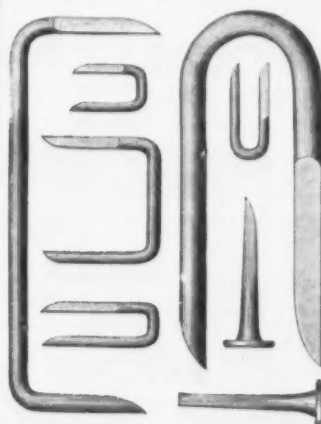
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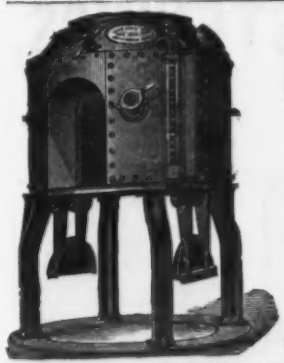
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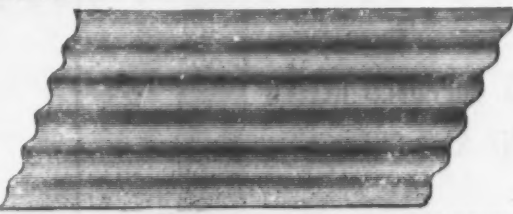
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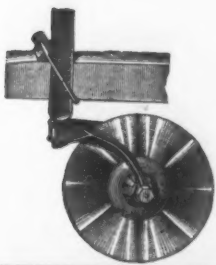
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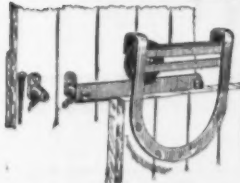
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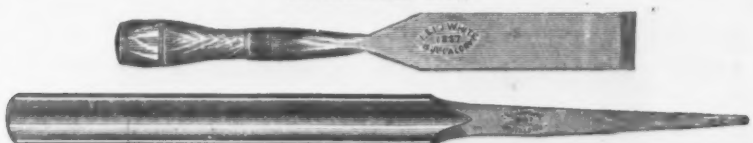
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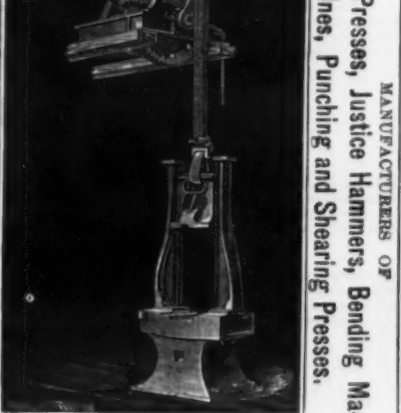
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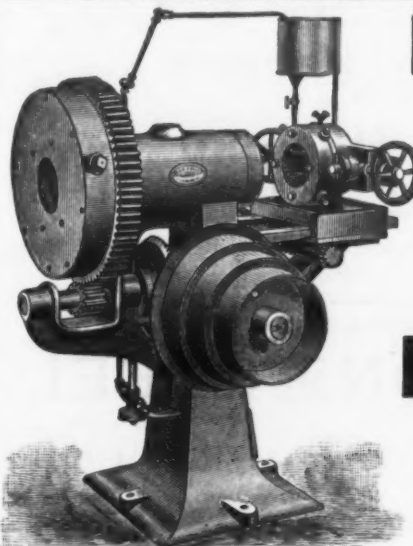
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**Anvils.** Wright's, 100 lbs. \$10.00  
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Eagle Anvil, American, 100 lbs. 10.00  
**Apple Pare.** 500 lbs. 5.00  
White Mountain, 500 lbs. 5.00  
Lots of 10 to 25 dozen, special price.

**Axes.** Hunt's Kentucky and Yankee, 40 lbs. net \$6.50  
Robert Mann, 40 lbs. net 6.00  
Favorite 40 lbs. net 5.50  
Beveled Axes, 40 lbs. net 5.00  
Double Bit Axes, 40 lbs. net 5.00  
**Augers and Auger Bits.** New List, January 7, 1885.

Snell's Augers and Bits, 40 lbs. net \$6.00  
New Haven Copper Company, 40 lbs. net 5.00  
Benjamin Pierce Auger Bits, 40 lbs. net 4.00  
Jennings' Auger Bits, new list Jan. 1, 1884, 40 lbs. net 3.50  
Cook's Auger Bits and Augers, 40 lbs. net 3.00  
Smith's Ship Augers, 40 lbs. net 2.50  
Watrous' Ship Augers, 40 lbs. net 2.00  
Bouney's Flat Bit Augers, list \$4.00 per doz. 20.00  
Stearns' Flat Bit Augers, list \$4.00 per doz. 20.00  
**Belts.** Light and Common, 40 lbs. net 10.00  
Bevin Bros. Mfg. Co. Light Hand Belts, 40 lbs. net 7.50  
Light Hand Belts, 40 lbs. net 7.50  
Swiss Pattern Hand Belts, 40 lbs. net 6.00  
Connell's Door Belts, 40 lbs. net 5.00  
G. Western & Kentucky Cow, new list, 40 lbs. net 7.00

**Boring Machines.** Upright, without Augers, list \$5.50  
Angular, without Augers, list 5.00  
**Boils.** Eastern Carriage Boils, new list Jan. 10, 1885, 40 lbs. net 5.00  
Philadelphia Carriage Boils, 40 lbs. net 4.50  
Stanley, Wrought Shutter, 40 lbs. net 4.00  
**Braces.** Barber's Improved, 40 lbs. net 4.00  
Barber's Old Style, 40 lbs. net 3.50  
Backus, 40 lbs. net 3.00  
Spofford, 40 lbs. net 2.50  
American Belt, 40 lbs. net 2.00  
**Bulls.** Cast Fast Joint, Narrow, 40 lbs. net 4.00  
Cast Fast Joint, Broad, 40 lbs. net 4.00  
Cast Loose Joint, Narrow, 40 lbs. net 3.50  
Cast Loose Joint, Broad, 40 lbs. net 3.50  
Cast Acorn, Loose Pin, 40 lbs. net 3.00  
Cast Acorn, Tight Pin, 40 lbs. net 3.00  
Cast Mayer's Loose Joint, 40 lbs. net 2.50  
Wrought Table Hinges and Back Flaps, 40 lbs. net 2.50  
Wrought Loose Joint, 40 lbs. net 2.00  
Wrought Narrow Flap, 40 lbs. net 1.50  
**Blind Butts.** Parker, 40 lbs. net 7.50  
Clark, 40 lbs. net 7.00  
Lull & Porter, 40 lbs. net 6.50  
Huffer's, 40 lbs. net 6.00  
**Casters.** Bed new list July 1, 1880, 40 lbs. net 6.00  
Plate, 40 lbs. net 5.50  
**Chains.** German Halter and Coll, list Jan. 1, 1884, 40 lbs. net 5.00  
Galvanized Pump, 40 lbs. net 4.50  
Best Proof Coil Chain—English, 40 lbs. net 4.00  
Best Proof Coil Chain—American, 40 lbs. net 3.50  
**Chisels.** Socket Framing, 40 lbs. net 7.50  
Socket Firmer, 40 lbs. net 7.00  
Butcher's, 40 lbs. net 6.50  
**Coffee Mills.** Box and Side new list Jan. 1, 1885, 40 lbs. net 4.00  
Enterprise, 40 lbs. net 3.50  
**Cutlery.** Walden Pocket, 40 lbs. net 4.00  
Pennsylvania Knife Co., new list net  
Lenders, Frary & Clark, 40 lbs. net 3.50  
Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

**Drawing Knives.** Hart Mfg. Co., 40 lbs. net 7.50  
Adjustable Handle, 40 lbs. net 7.00  
**Fry Pans.** Tinned, 40 lbs. net 4.50  
\$ doz. \$5.00 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50  
No. 1 2 3 4 5 6 7 8 9 10  
**Files.** Nicholson, 40 lbs. net 6.00  
Dixon, 40 lbs. net 5.50  
Butcher, 40 lbs. net 5.00  
Crown and Arrow, 40 lbs. net 4.50  
**Fluting Machines.** Eagle, 40 lbs. net 4.50  
Eagle, 40 lbs. net 4.00  
Crown—4 in. roll, 40 lbs. net 3.50  
Crown—6 in. roll, 40 lbs. net 3.00  
Crown—8 in. roll, 40 lbs. net 2.50  
Geneva Fluter, 40 lbs. net 2.00  
**Hammers.** Yerkes & Plumb's, new list 40 lbs. net 4.00  
Mayhew Hammer, 40 lbs. net 3.50  
Howell A. E. Nail Hammer, 40 lbs. net 3.00  
**Handles.** Diston Loop Handles Cross-Cut, 40 lbs. net 3.50  
Boynton Loop Handles Cross-Cut, 40 lbs. net 3.00  
**Hatchets.** Yerkes & Plumb, new list, 40 lbs. net 4.50  
Hunt, 40 lbs. net 4.00  
**Hay and Straw Knives.** Electric, 40 lbs. net 10.00  
Lightnings, 40 lbs. net 9.00  
Wadsworth, 40 lbs. net 8.00  
Walton Straw Knives, 40 lbs. net 7.00  
**Hinges.** Strap and T, 40 lbs. net 10.00  
Horse Nails, Nos. 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

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No. 1 2 3 4 5 6 7 8 9 10

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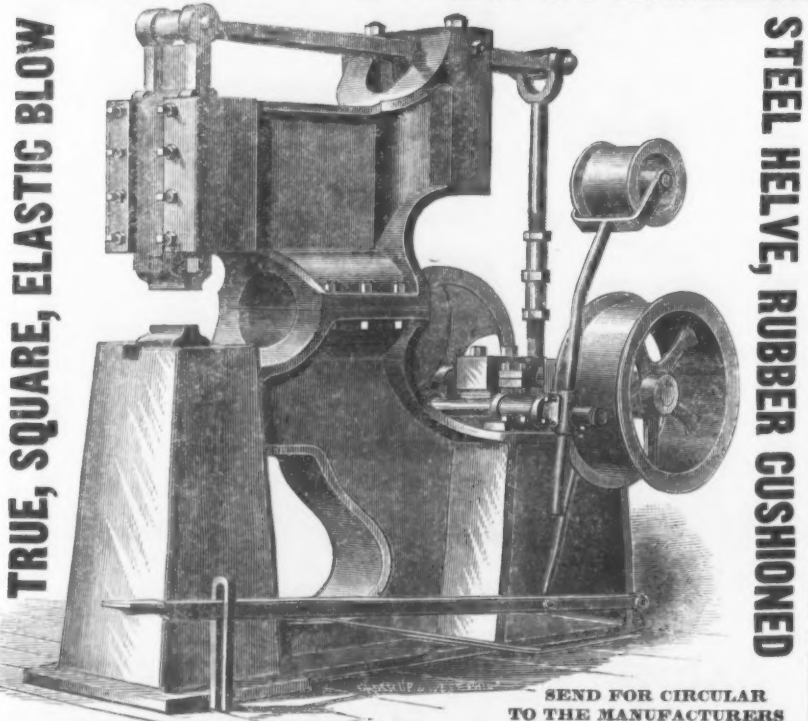
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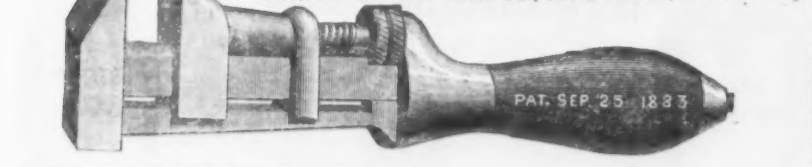
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Made of the very best materials; simple in con-  
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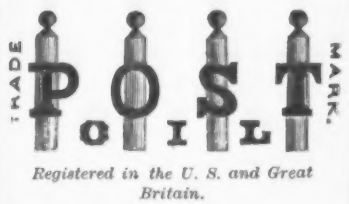
HARVARD ROLLER SKATE CO.,  
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## POST'S

Waterproof Belt Oil  
and Leather  
Preservative,  
FOR WET AND DRY LEATHER  
BELTING.



The Standard Belt  
Oil of the  
World.

Leather dressed with this oil will not  
crack or rot, as heat, cold, water or gas  
has no effect on it. It will spread one-third  
further and last much longer than any oil  
for the same purpose. It never turns  
rancid; will keep in any climate. Belts  
may be run in water at one end and a hot  
room at the other, and still be soft, dry  
and pliable. Warranted not to start glue-  
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keep the surface perfectly smooth.

Beware of Imitations Sold at a  
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is well Calculated to Deceive.

In their Treatise on Machine Belting,  
J. B. HOYT & CO. speak of Post's  
Oil as follows:

### OILING OF BELTS.

"Care should be taken that belts are kept  
soft and pliable. For this purpose we  
decidedly advise the use of 'POST'S  
WATERPROOF BELT OIL AND  
LEATHER PRESERVATIVE.'  
When applied as DIRECTED, it makes the  
Belt smooth, pliable and adhesive, and  
causes it to hug the pulley closely, so that  
no power is lost from lack of pulley con-  
tact. It possesses excellent preservative  
qualities and also renders the leather more  
impervious to dampness than any article  
or preparation we know of.  
Moisture should not be allowed to pen-  
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apart."

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from your Belt Maker, send direct  
to us and we will see that you do  
get it.

PRICE, PER GALLON, \$1.50.

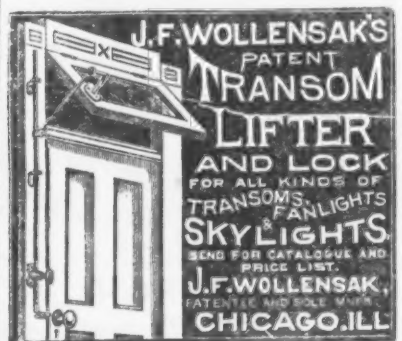
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25 " 37.50... no charge for 1/4 Bbls.  
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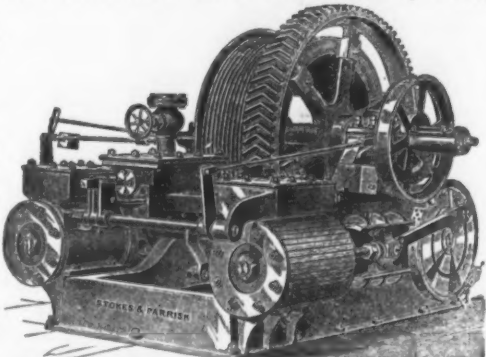
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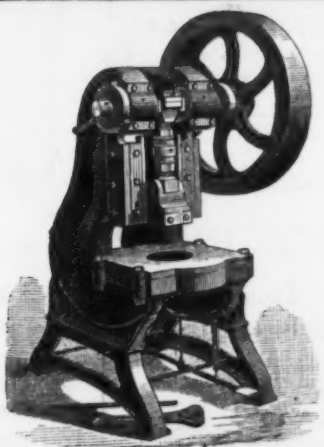
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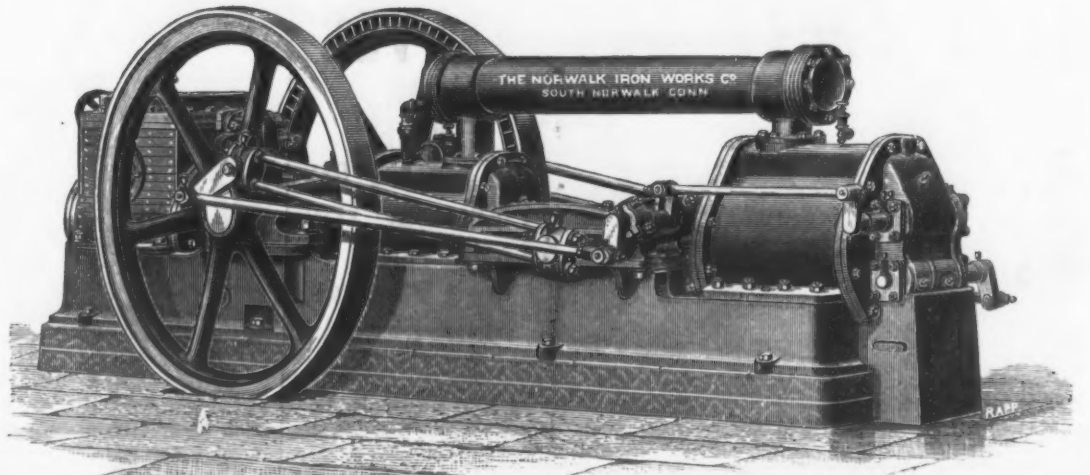
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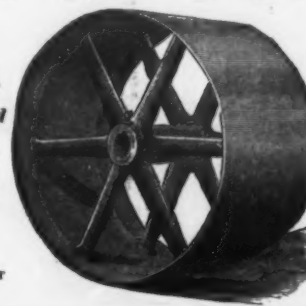
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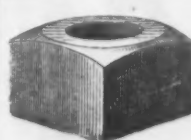


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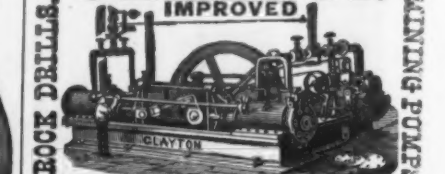
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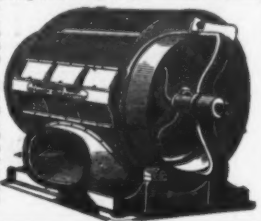


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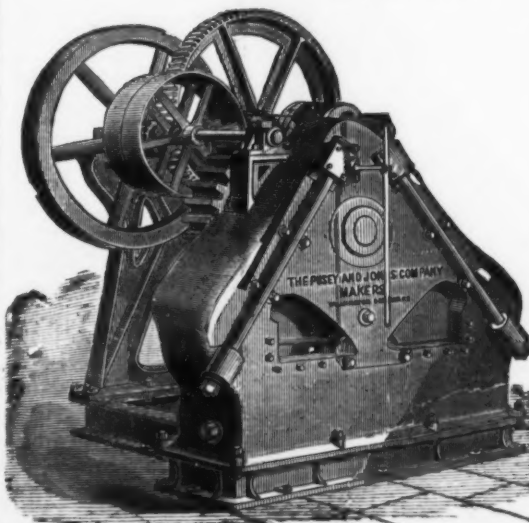
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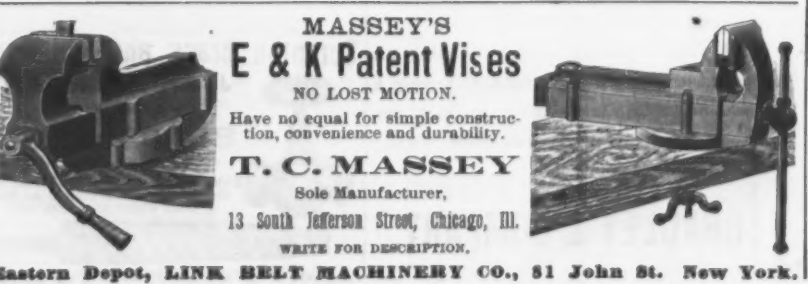
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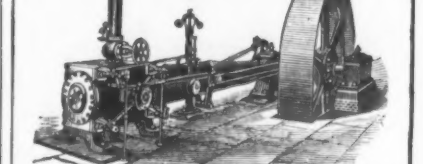
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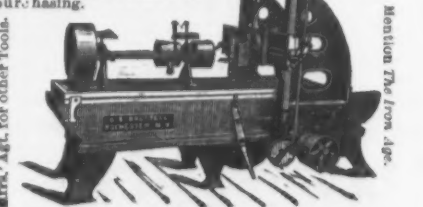
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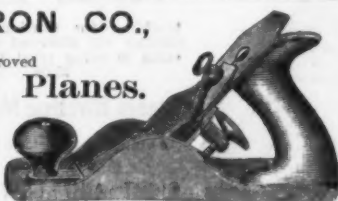
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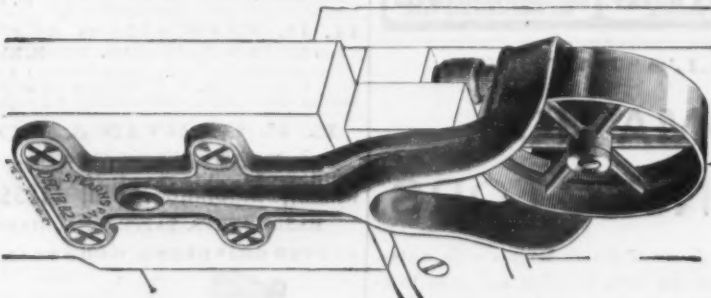
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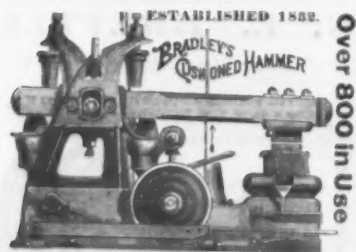
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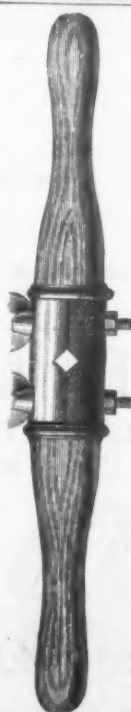
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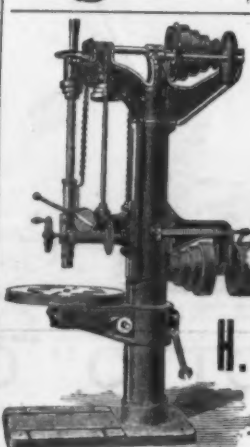
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